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SUBMERGED CULTURAL RESOURCES SURVEY OF THE VERMILION RIVER BETWEEN STATE ROUTE 353 TO THE MILTON BRIDGE, LAFAYETTE AND VERMILION PARISHES, LOUISIANA

FINAL REPORT
JULY 2001

PREPARED FOR:

U.S. Army Corps of Engineers
New Orleans District
P.O. Box 60267
New Orleans, Louisiana 70160-0267

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R. CHRISTOPHER GOODWIN & ASSOCIATES, INC.
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13. ABSTRACT ***(Maximum 200 words)***

This report presents the results of a Phase I Archeological Remote Sensing Survey of the Vermilion River in Lafayette and Vermilion parishes, Louisiana. These investigations were conducted from November 1 – 9, 2000, by R. Christopher Goodwin & Associates, Inc., on behalf of the U.S. Army Corps of Engineers, New Orleans District (USACE-NOD), in support of the proposed maintenance dredging of approximately 17.5 miles of the Vermilion River. This study was undertaken to assist the USACE-NOD to satisfy its responsibilities under Section 106 of the National Historic Preservation Act of 1966, as amended, prior to the disposal of dredged material at this location. All aspects of the investigations were completed in compliance with the Scope-of-Work and with the Secretary of the Interior's *Standards and Guidelines for Archeology and Historic Preservation* (Federal Register 48, No 190, 1983). The study area for this project consisted of nine survey blocks, each measuring approximately two miles long and consisting of 1 to 3 adjacent lines, depending on the width and depth of the river and the amount of encumbering debris. The survey area measured a total of 92,400 ft in length, with an average width of 132 ft and encompassed approximately 281.3 acres.

The objectives of this study were to identify specific targets that might represent significant submerged cultural resources, modern debris, pipelines, cables, or related items within the project area, and to provide the USACE-NOD with management recommendations for any cultural resources present. These objectives were met applying a research design that combined background archival investigations and a riverine archeological remote sensing survey.

Background archival investigations indicated a low potential for encountering submerged historic cultural resources within the project area. A review of Louisiana archeological site files and relevant research reports documented no sites within the survey area. A review of Louisiana's shipwreck database identified two possible sites (*Georgia,* a 137-ton sidewheel steam boat, and *Gretna,* a 22-ton sidewheel ferry). Review of the National Oceanic and Atmospheric Administration's (NOAA) Automated Wreck and Obstruction Information System (AWOIS) and of secondary sources yielded no wrecks in the survey area.

Archeological investigations consisted of controlled riverine remote sensing survey of approximately 17.5 survey miles, or 44 linear miles, of river bottom. This survey utilized a differential global positioning system (DGPS), digital recording side scan sonar, a recording proton precession magnetometer, and hydrographic navigational computer software. The survey was conducted with a lane spacing of 50 ft, when possible, to ensure the greatest detail in coverage. The survey techniques ensured that any abandoned or wrecked historic vessels in the survey area would be detected.

The marine remote sensing survey registered a total of 296 individual magnetic anomalies and 43 individual acoustic anomalies. Of these, 131 magnetic anomalies and 23 acoustic anomalies comprised 60 clusters or targets. All of the acoustic anomalies appeared to represent modern disturbances, such as bridge pilings, pipelines or cables, bulkheads, bank debris, or modern ferrous debris. Such anomalies do not represent significant archeological resources. None of the 60-magnetic/acoustic target groups represented structures that could constitute a shipwreck or other significant cultural resource.

No significant cultural resources were identified within this project area. Therefore, no additional archeological studies of the Vermilion River dredging project area are warranted or recommended.

14. SUBJECT TERMS	15. NUMBER OF PAGES
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DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT. CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF:

May 11, 2001

Planning, Programs, and
Project Management Division
Environmental Planning and
Compliance Branch

To The Reader:

The U.S. Army, Corps of Engineers, New Orleans District (NOD) will dredge approximately 17.5 miles of the Vermilion River in and around the city of Lafayette, from the Highway 353 bridge to the Milton Bridge. In order to avoid impacts to significant underwater cultural resource sites, NOD conducted a submerged cultural resources survey via remote sensing within the project right-of-way. As a result, no significant cultural resources were identified within the area of potential effects. Thus, the proposed project will not affect cultural resources. NOD and the Louisiana State Historic Preservation Officer concur with the authors' conclusions and recommendations. We commend R. Christopher Goodwin and Associates, Inc. for a job well done.

Edwin Lyon
Contracting Officer's
Representative

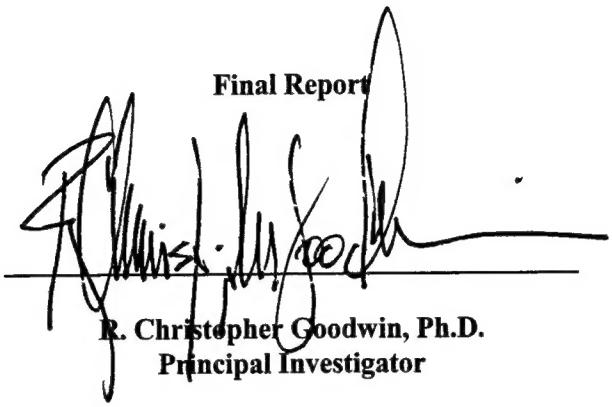
David Carney
Chief, Environmental
Planning and Compliance
Branch

ACKNOWLEDGEMENTS

R. Christopher Goodwin & Associates, Inc. gratefully acknowledges the assistance of the numerous individuals from outside agencies and institutions who contributed to the Vermilion River Remote Sensing Project. We particularly would like to thank Mr. Paul Hughbanks of the U.S. Army Corps of Engineers, New Orleans District, for his generous support and expert guidance with the project. Special thanks also are due to the staffs of the following repositories: the National Archives in Washington D.C.; Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, Divisions of Archaeology and Historic Preservation; and, the Howard-Tilton Memorial Library at Tulane University.

SUBMERGED CULTURAL RESOURCES SURVEY OF THE VERMILION RIVER BETWEEN STATE ROUTE 353 TO THE MILTON BRIDGE, LAFAYETTE AND VERMILION PARISHES, LOUISIANA

Final Report



R. Christopher Goodwin, Ph.D.
Principal Investigator

by

Jean B. Pelletier, M.A., Susan Barrett Smith, B.A.,
Jeremy P. Pincoske, B.A., and R. Christopher Goodwin, Ph.D.

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June 2001

for

U.S. Army Corps of Engineers
New Orleans District
P.O. Box 60267
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CHAPTER I

INTRODUCTION

This report presents the results of Phase I marine archeological remote sensing survey for maintenance dredging sites along 17.5 miles of the Vermilion River, from Lafayette to Milton, Louisiana (Figure 1). These investigations were conducted from November 1 – 9, 2000, by R. Christopher Goodwin & Associates, Inc. on behalf of the U.S. Army Corps of Engineers, New Orleans District (USACE-NOD). This survey was conducted in support of the proposed dredge maintenance project between the Highway 353 bridge and the Milton Bridge in Milton, LA, on the Vermilion River (Figure 2).

In keeping with the New Orleans District's mission to preserve, document, and protect significant cultural resources, remote sensing survey was undertaken to locate potential archeological remains and in so doing, to assist the USACE-NOD in satisfying its responsibilities under Section 106 of the National Historic Preservation Act of 1966, as amended. All aspects of the investigations were completed in compliance with the Scope-of-Work; with 36 CFR 800, "Protection of Historic Properties;" with the Abandoned Shipwreck Act of 1987 (43 U.S. C. 2101 – 2106); with the Abandoned Shipwreck Guidelines, National Park Service; with National Register Bulletins 14, 16, and 20; with 36 CFR 66; and with the Secretary of the Interior's *Standards and Guidelines for Archeology and Historic Preservation* (Federal Register 48, No 190, 1983).

The Vermilion River survey area consisted of nine survey blocks: eight blocks each approximately two miles long, and one block measuring one and a half miles long, with every block consisting of one to three adjacent lines (Figure 3a-i). A total of approximately 17.5 linear miles of river bottom were surveyed, with the total area measuring approximately 92,400 ft long by 132 ft wide (approximately 281.3 acres). The following UTM Zone 15 coordinates provided by the USACE-NOD delineated the survey area:

Highway 353 X=600497.438
Y=3343528.500

Milton Bridge X=588677.375
Y=3330660.250

Research Objectives and Design

The objectives of the study were to identify all submerged and visible watercraft and other maritime related cultural resources, as well as pipelines, cables, modern debris, construction or commercial materials, and related items in the Vermilion River project area; and, whenever possible, to assess the National Register of Historic Places (NRHP) eligibility of identified resources, applying the Criteria for Evaluation (36 CFR 60.4 [a-d]. In addition, this study was designed to provide the USACE-NOD with management recommendations for any cultural resources present. These objectives were addressed through a combination of archival research and field survey. The background history of the project area was researched through examination of archeological site files for the State of Louisiana, local historical literature files, previous cultural resources investigations conducted in the vicinity of the project area, historic maps, relevant primary map and microfilm records, and secondary literature.

Field survey of the project area was conducted in accordance with the Scope-of-Work from the USACE-New Orleans District and the technical proposal prepared by R. Christopher Goodwin & Associates, Inc. The 17.5 mi long project area was divided into nine blocks, each of which was surveyed along one to three parallel track lines or transects spaced at 50 ft intervals. The equipment array included a DGPS, a proton precession marine magnetometer, side scan sonar, and a digital fathometer. The survey was conducted from the 24 ft research vessel *Coli,* leased from the Louisiana Universities Marine Consortium (LUMCON). Data were collected and correlated by a laptop computer using hydrographic survey software. Data were inventoried, post-processed, and analyzed to identify specific targets that might represent significant submerged cultural resources within the project area.

R. Christopher Goodwin, Ph.D., served as Principal Investigator for this project. Mr. Jean B. Pelletier, M.A., served as Project Manager and directed all aspects of data collection and subsequent analysis. Susan Barrett Smith, B.A., served as project historian, and Paul Heinrich, Ph.D., provided the natural settings research and text. Barry Warthen, A.A. and David Olney, B.A. prepared the graphics, and Chris Archer, B.S. incorporated all data into a GIS format. Sharon Little produced the report.

Organization of the Report

This report develops the natural and historical contexts of the project area as the basis for analysis and interpretation. The geological characteristics of the project area are discussed in Chapter II. Chapter III places the project area within its prehistoric settings and historic context, and develops a historic-chronological framework for retrodiction and subsequent evaluation of classes of submerged historic resources, particularly shipwrecks. Chapter IV assesses the archeological potential of the survey area, and presents the specific archival study results for the study area. Chapter V reviews research methods and sources used during archival and background investigation, and the instrumentation and methods employed during field survey and analysis. Chapter VI examines the results and analyses of the remote sensing survey. A summary of the study and management recommendations is provided in Chapter VII.

Appendix I contains the Scope-of-Work for this project. Appendix II contains information on built resources identified during the remote sensing survey, and Appendix III contains resumes of key project personnel.

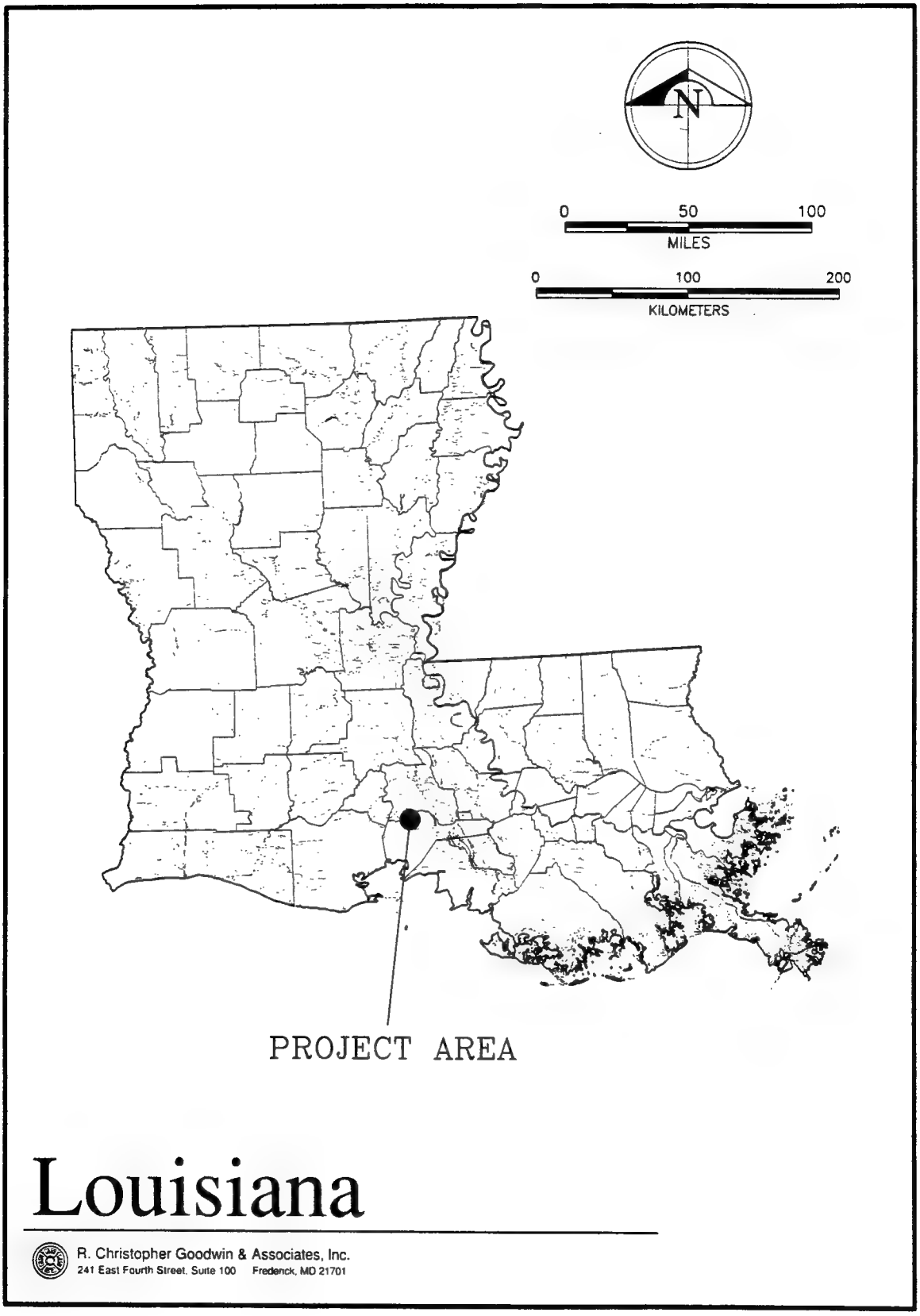


Figure 1. Map of Louisiana showing the location of the project area.

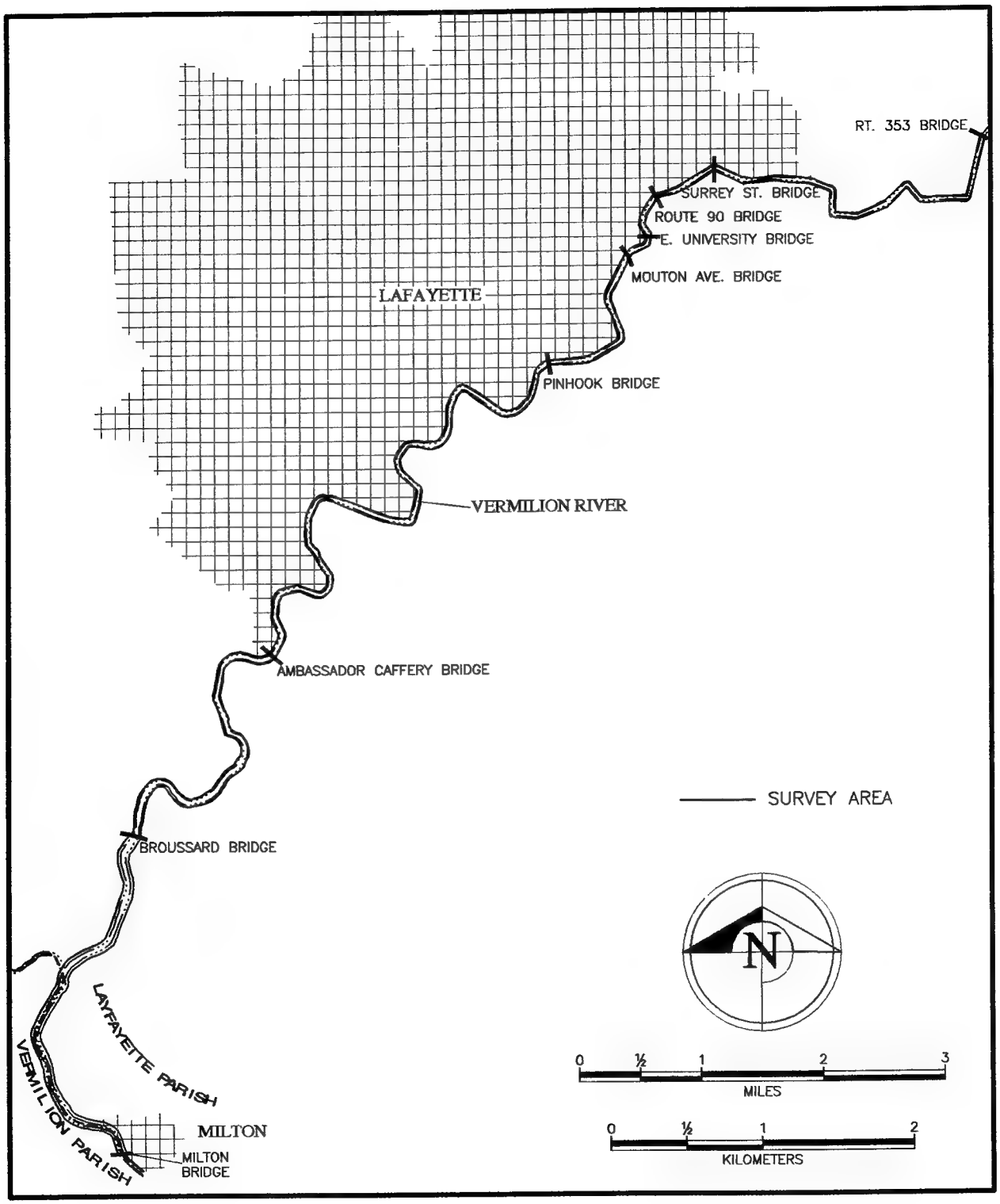
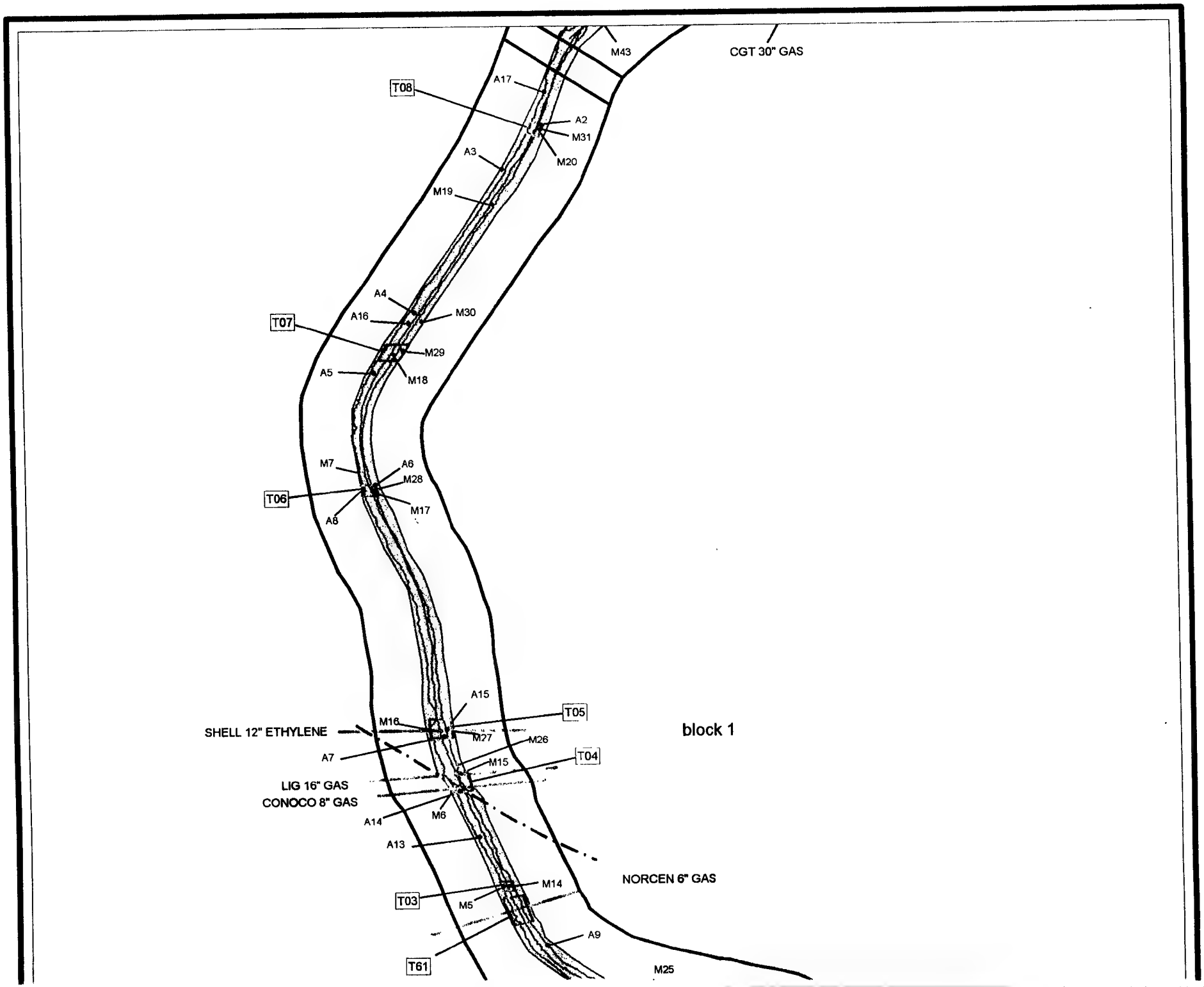


Figure 2. Project location map showing Vermilion River and study area in red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A16
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M18
M7
A6
M28
T06
M17
A8
A15
T05
SHELL 12" ETHYLENE
M16
M27
M26
A7
T04
M15
LIG 16" GAS
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M14
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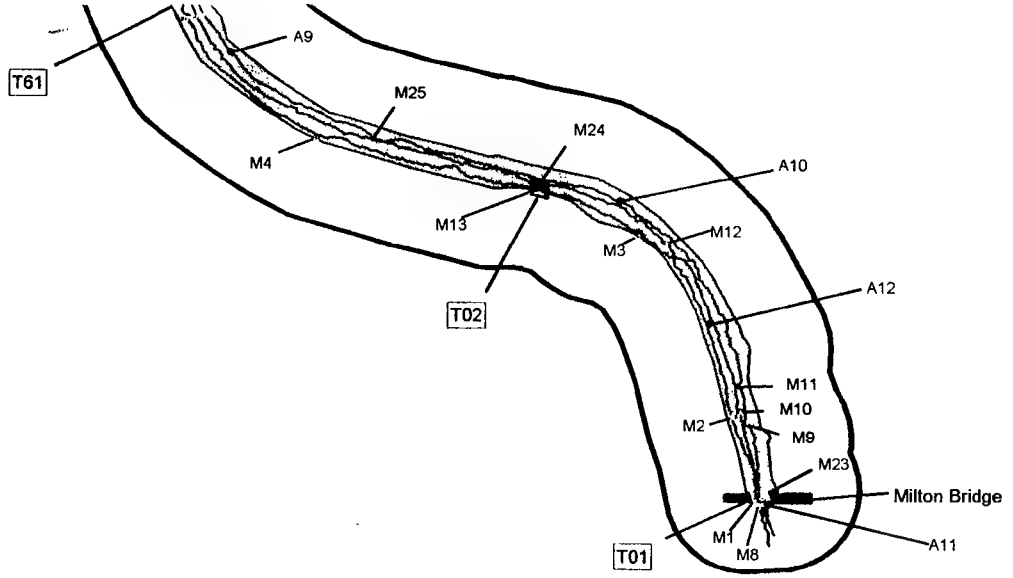
T61
M25
block 1



Acoustic Anomalies
Magnetic Anomalies
Targets
Track Lines
Boat Ramp
Mooring Facility
Bridge
Electrical Cable
Fuel Line
Railroad Bridge
Vermilion River

0 500 1000 1500 2000 2500 ft

VERMILION RIVER
REMOTE SENSING SURVEY
BLOCK 1 OF 9
Louisiana South State Plane Coordinate System NAD 83 Feet

N
W E
S

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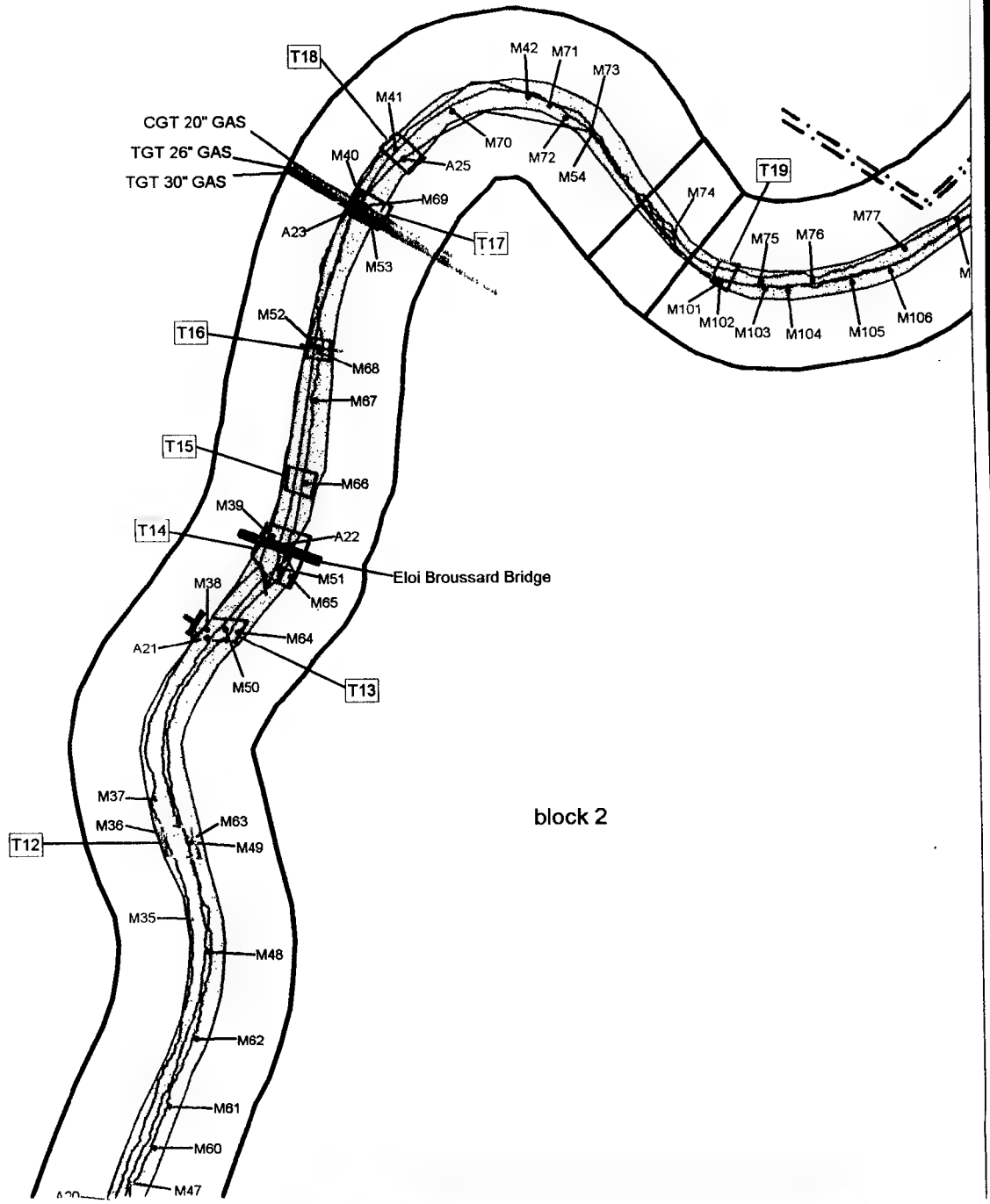
Figure 3a. Vermilion River Project area, showing survey blocks with tracklines, magnetic anomalies, acoustic anomalies, and targets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TGT 26" GAS
TGT 30" GAS
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M54
T19
M74
M69
A23
T17
M53
M77
M75
M76
M101
M102
M103
M104
M105
M106
M52
T16
M68
M67
T15
M66
M39
T14
A22
Eloi Broussard Bridge
M51
M38
M65
A21
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M37
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M63
T12
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M35
M48
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M61
M60
M47
block 2

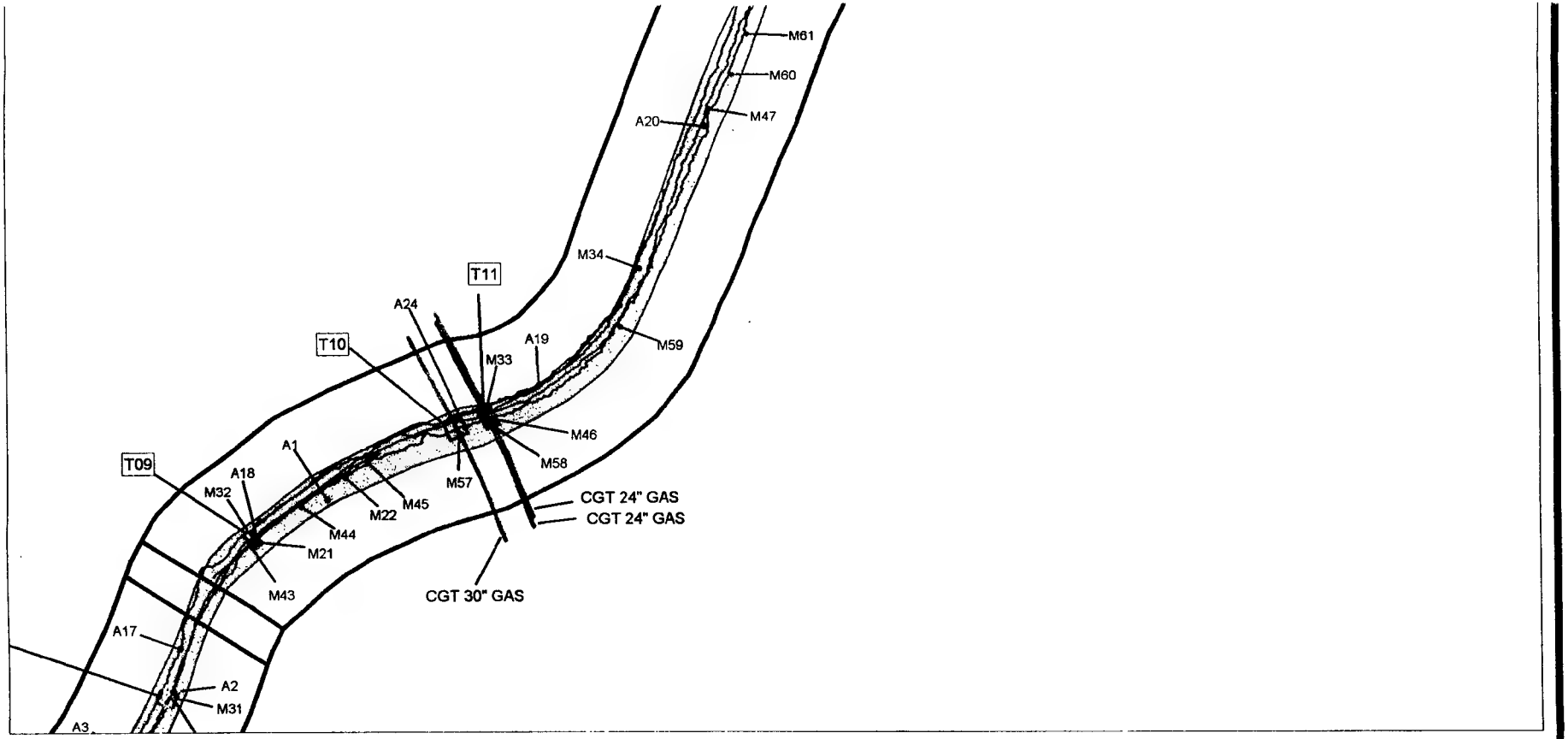
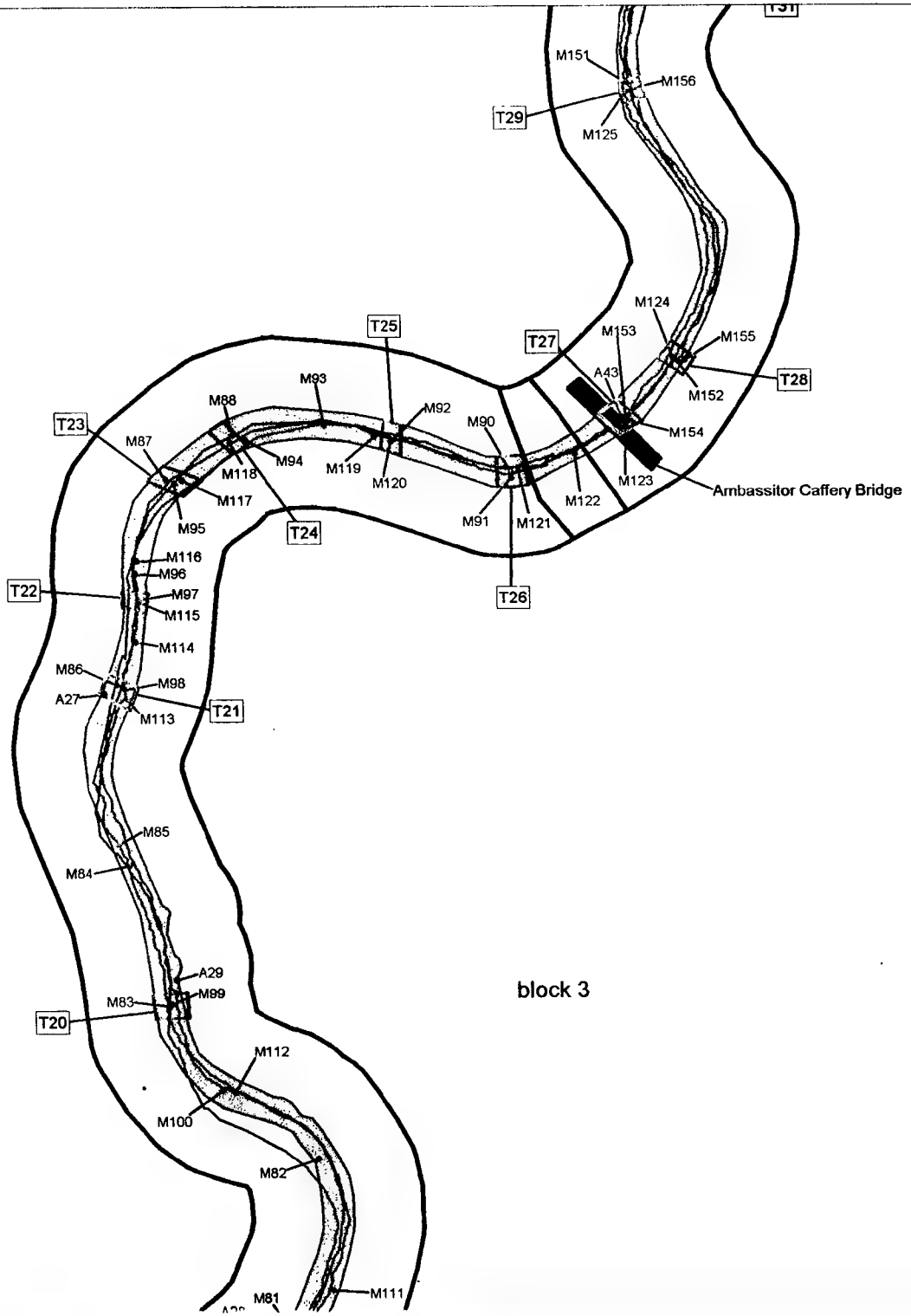


Figure 3b. Vermilion River Project area, showing survey blocks with tracklines, magnetic anomalies, acoustic anomalies, and targets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A43
T28
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M92
M90
T23
M154
M87
M94
M119
M120
M123
Ambassitor Caffery Bridge
M118
M117
M122
M95
T24
M91
M121
M116
T26
M96
T22
M97
M115
M114
M86
M98
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T21
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M85
M84
A29
M99
M83
T20
M112
M100
M82
M81
M111
block 3

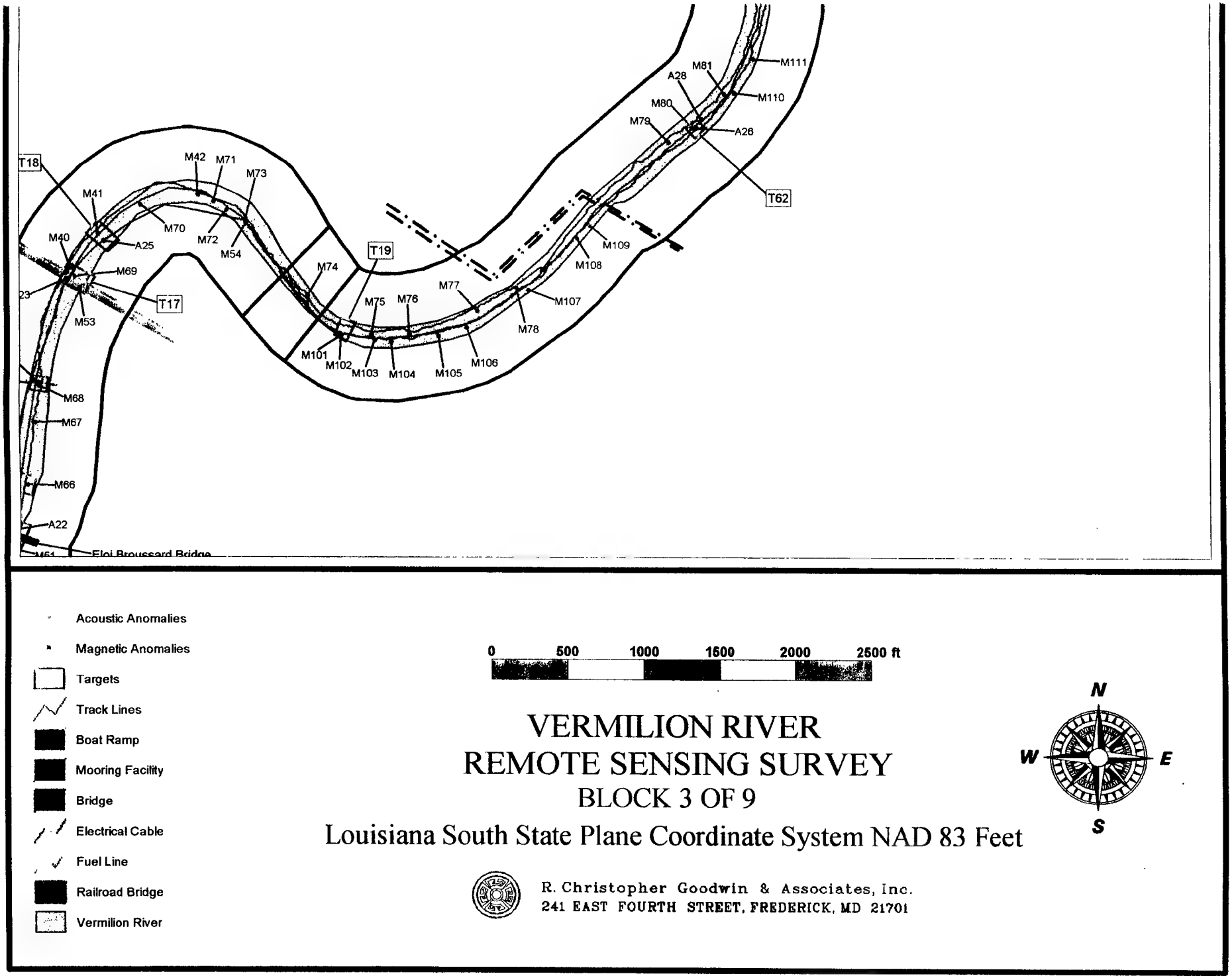
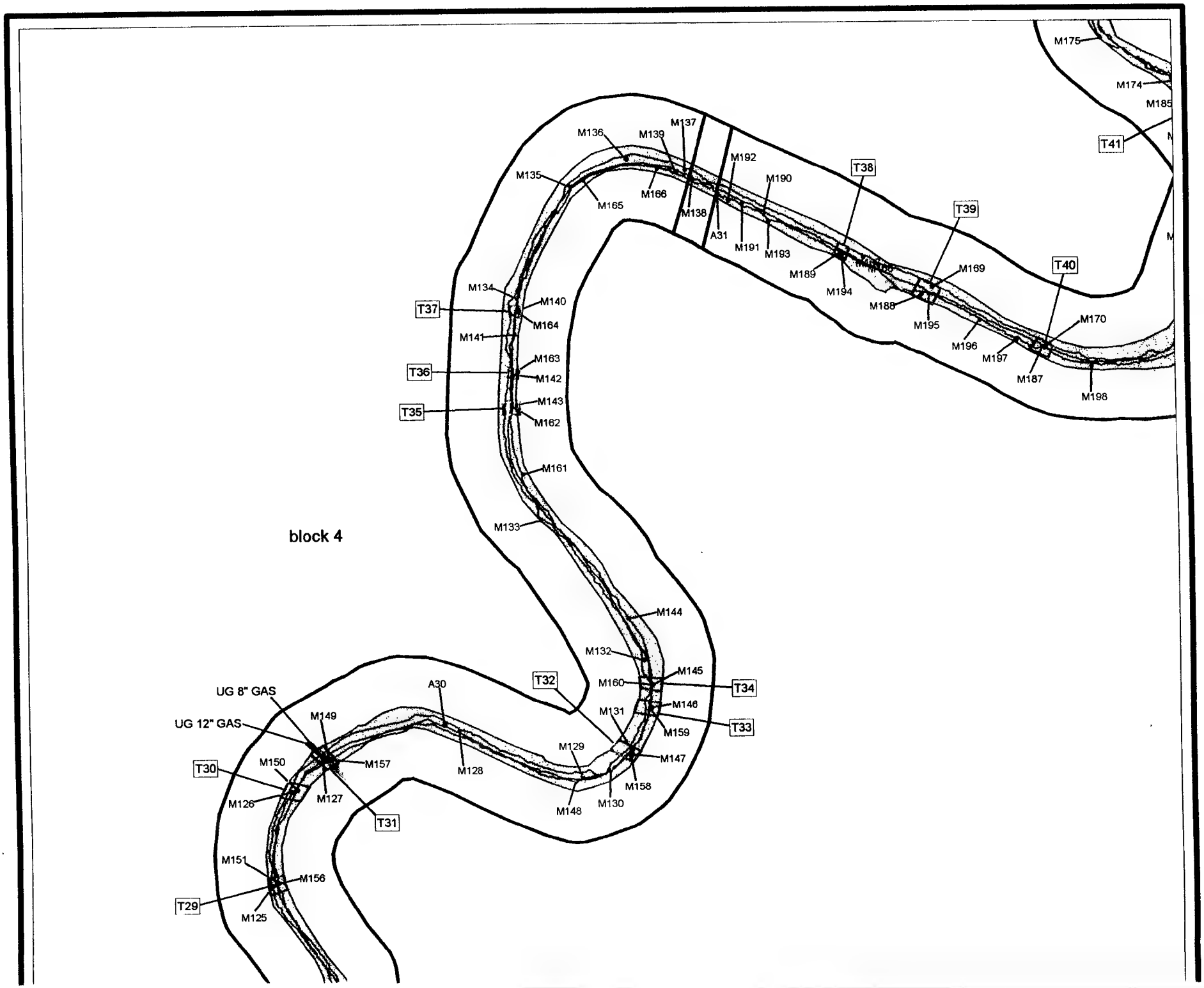


Figure 3c. Vermilion River Project area, showing survey blocks with tracklines, magnetic anomalies, acoustic anomalies, and targets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A31
M191
M193
T39
M189
M194
M169
T40
M188
M195
M170
M196
M197
M187
M198
M134
M140
T37
M164
M141
M163
T36
M142
M143
T35
M162
M161
M133
M144
M132
M145
T32
M160
T34
A30
UG 8" GAS
M146
M131
M159
T33
UG 12" GAS
M149
M129
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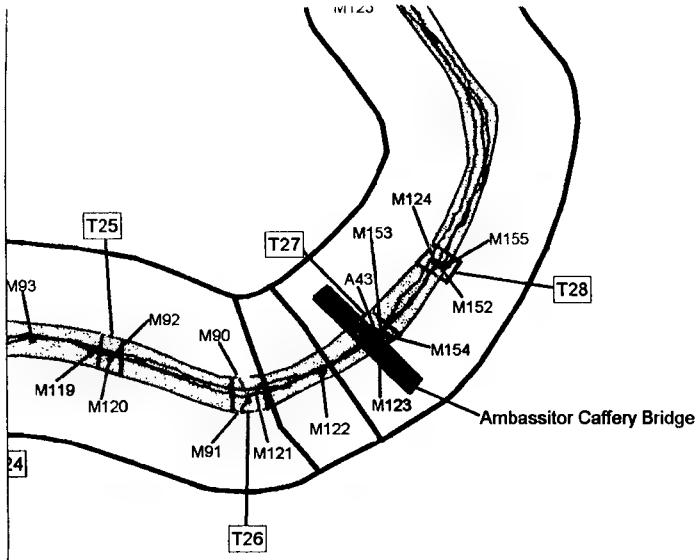

Acoustic Anomalies
Magnetic Anomalies
Targets
Track Lines
Boat Ramp
Mooring Facility
Bridge
Electrical Cable
Fuel Line
Railroad Bridge
Vermilion River

0 500 1000 1500 2000 2500 ft

N
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VERMILION RIVER
REMOTE SENSING SURVEY
BLOCK 4 OF 9
Louisiana South State Plane Coordinate System NAD 83 Feet

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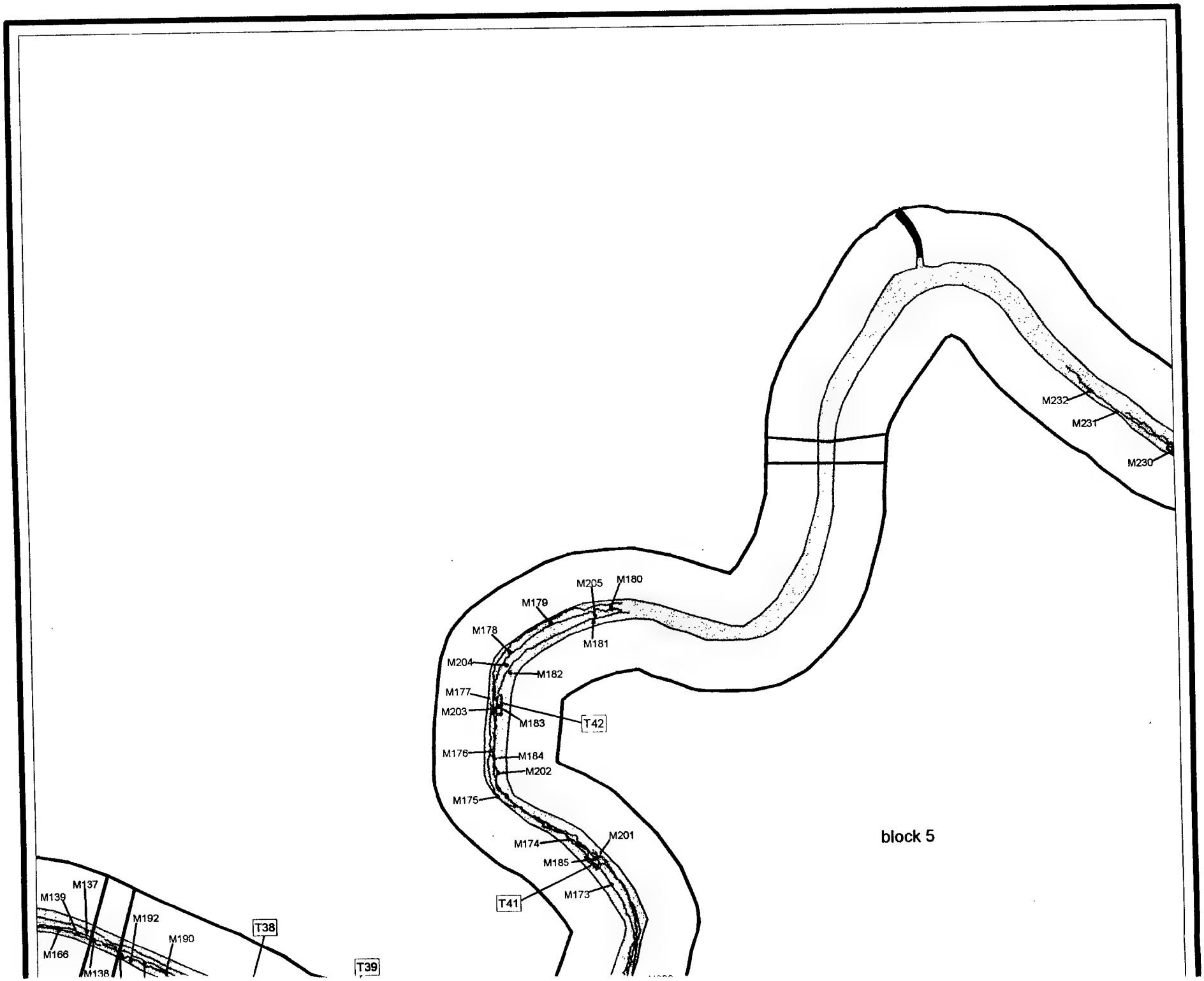
Figure 3d. Vermilion River Project area, showing survey blocks with tracklines, magnetic anomalies, acoustic anomalies, and targets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M166
M138
T39

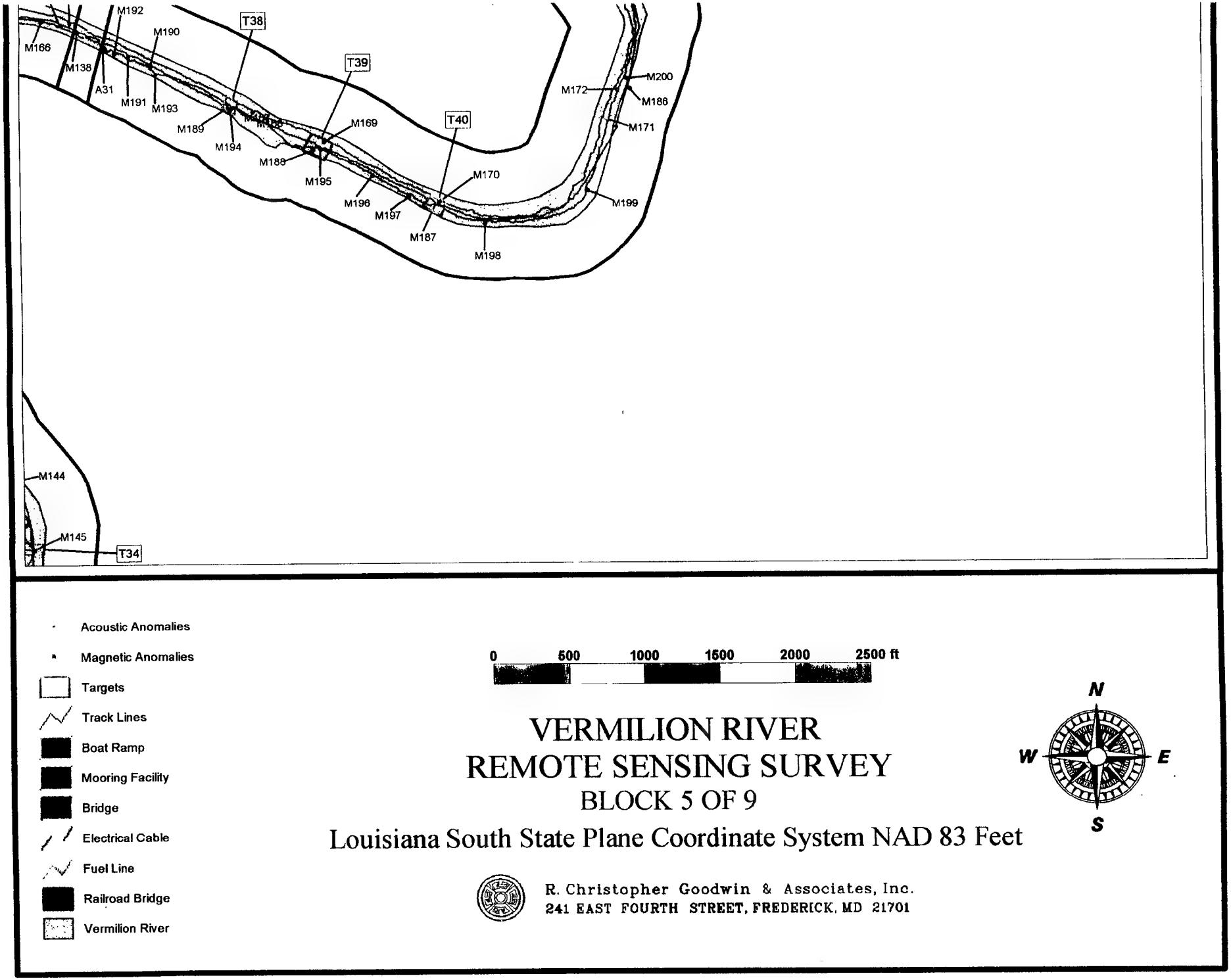
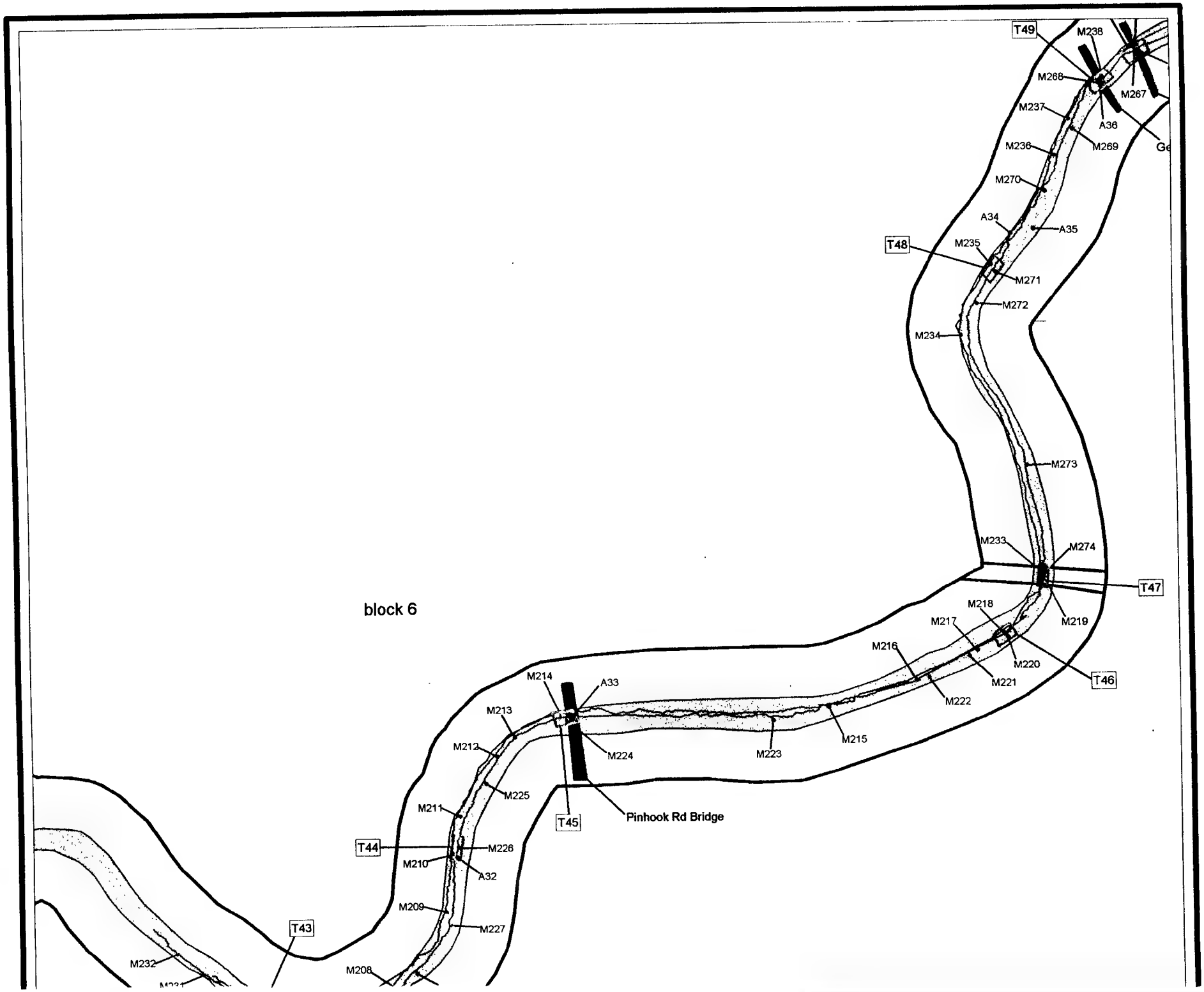


Figure 3e. Vermilion River Project area, showing survey blocks with tracklines, magnetic anomalies, acoustic anomalies, and targets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M269
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A35
T48
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M234
M273
M233
M274
T47
block 6
M218
M217
M219
M216
M220
M221
T46
M222
M214
A33
M213
M215
M212
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Pinhook Rd Bridge
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M226
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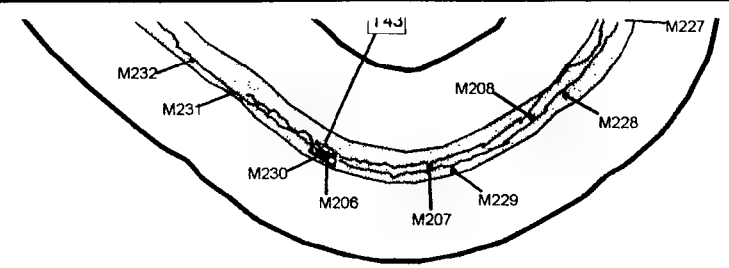

Acoustic Anomalies
Magnetic Anomalies
Targets
Track Lines
Boat Ramp
Mooring Facility
Bridge
Electrical Cable
Fuel Line
Railroad Bridge
Vermilion River

0 500 1000 1500 2000 2500 ft

VERMILION RIVER
REMOTE SENSING SURVEY
BLOCK 6 OF 9
Louisiana South State Plane Coordinate System NAD 83 Feet

N
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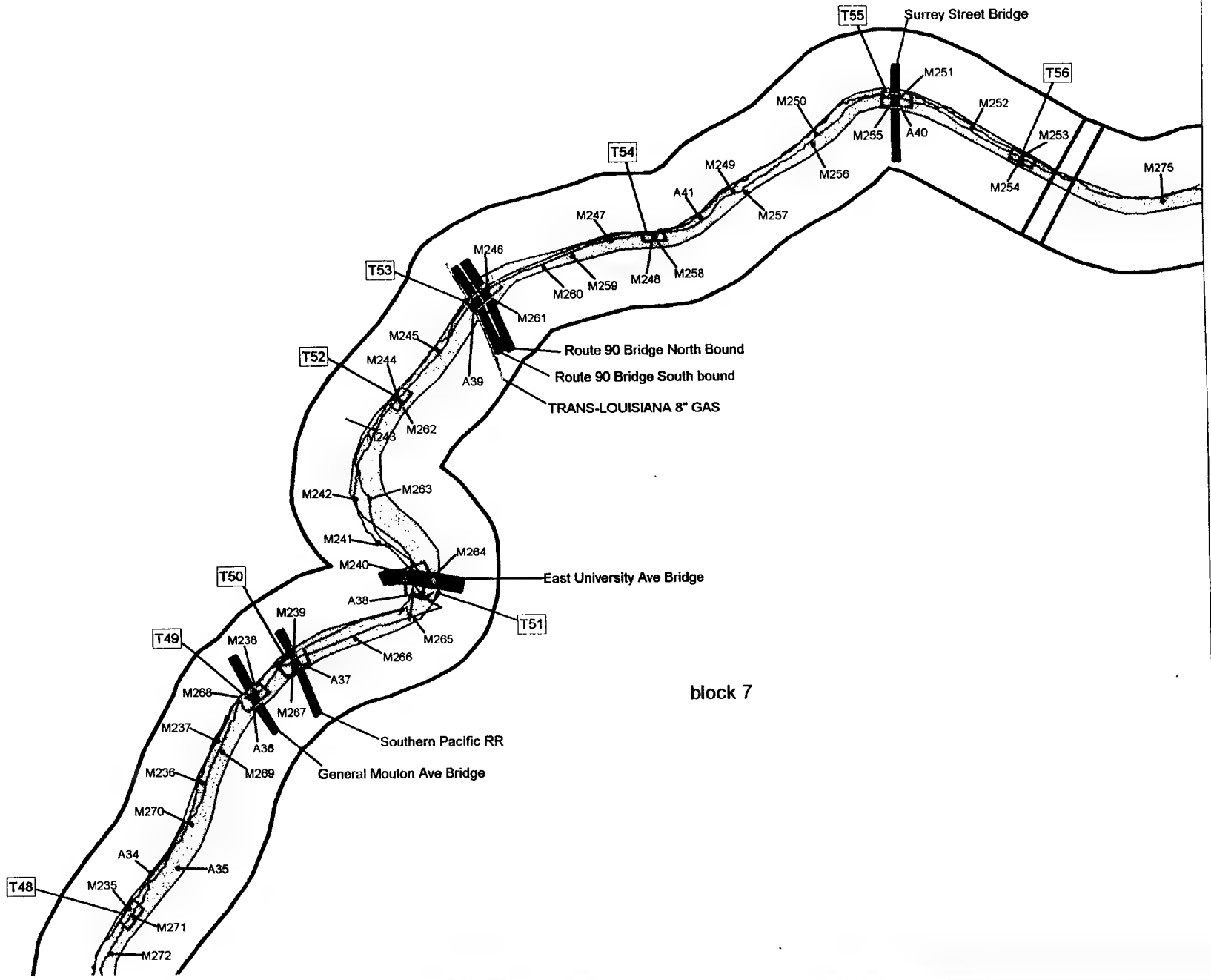
Figure 3f. Vermilion River Project area, showing survey blocks with tracklines, magnetic anomalies, acoustic anomalies, and targets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M247
M246
T53
M260
M259
M248
M258
M261
M245
Route 90 Bridge North Bound
T52
M244
Route 90 Bridge South bound
A39
TRANS-LOUISIANA 8" GAS
M243
M262
M242
M263
M241
M264
M240
East University Ave Bridge
T50
A38
T51
M239
T49
M238
M265
M266
A37
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M271
M272

block 7

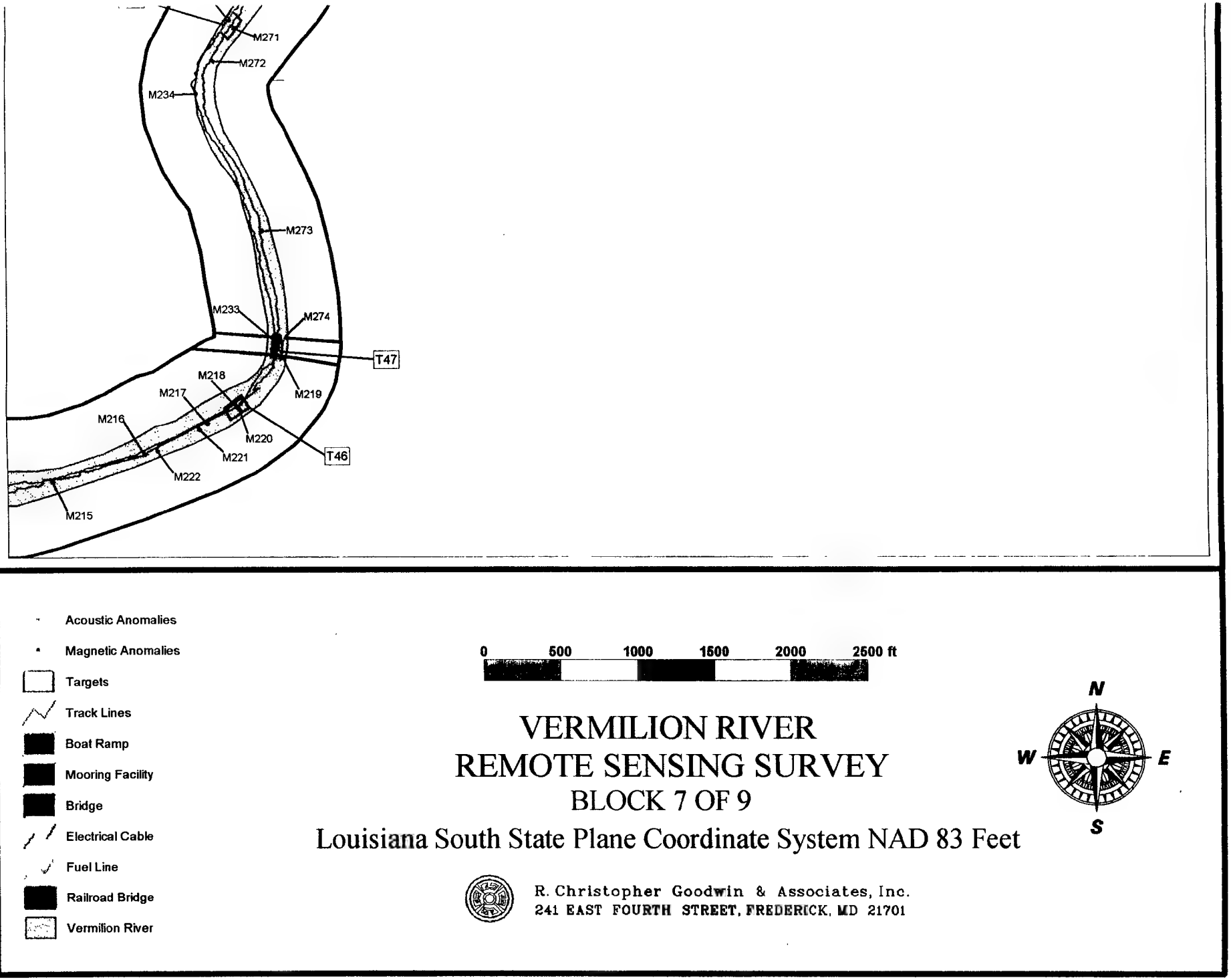
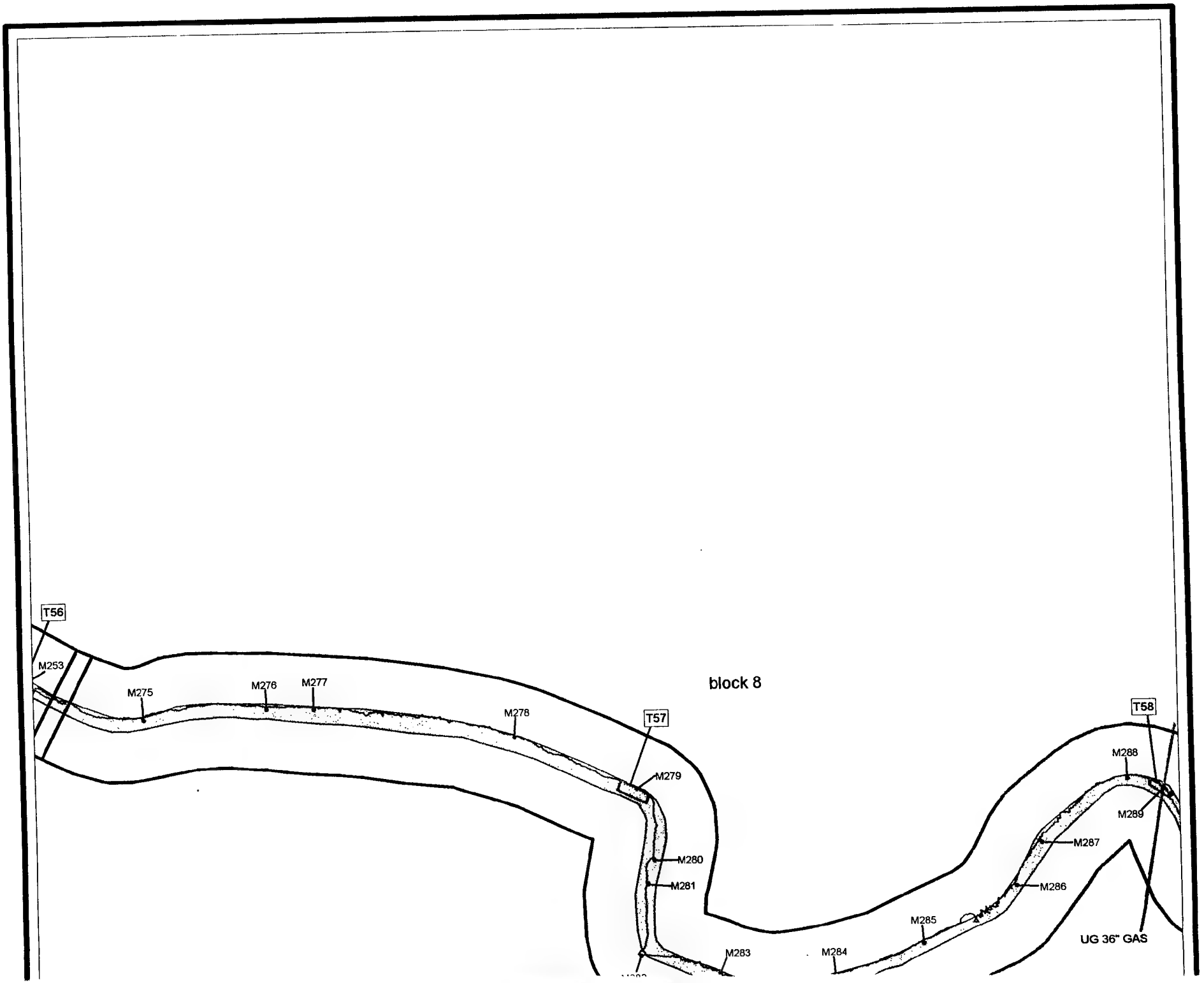


Figure 3g. Vermilion River Project area, showing survey blocks with tracklines, magnetic anomalies, acoustic anomalies, and targets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UG 36" GAS
block 8

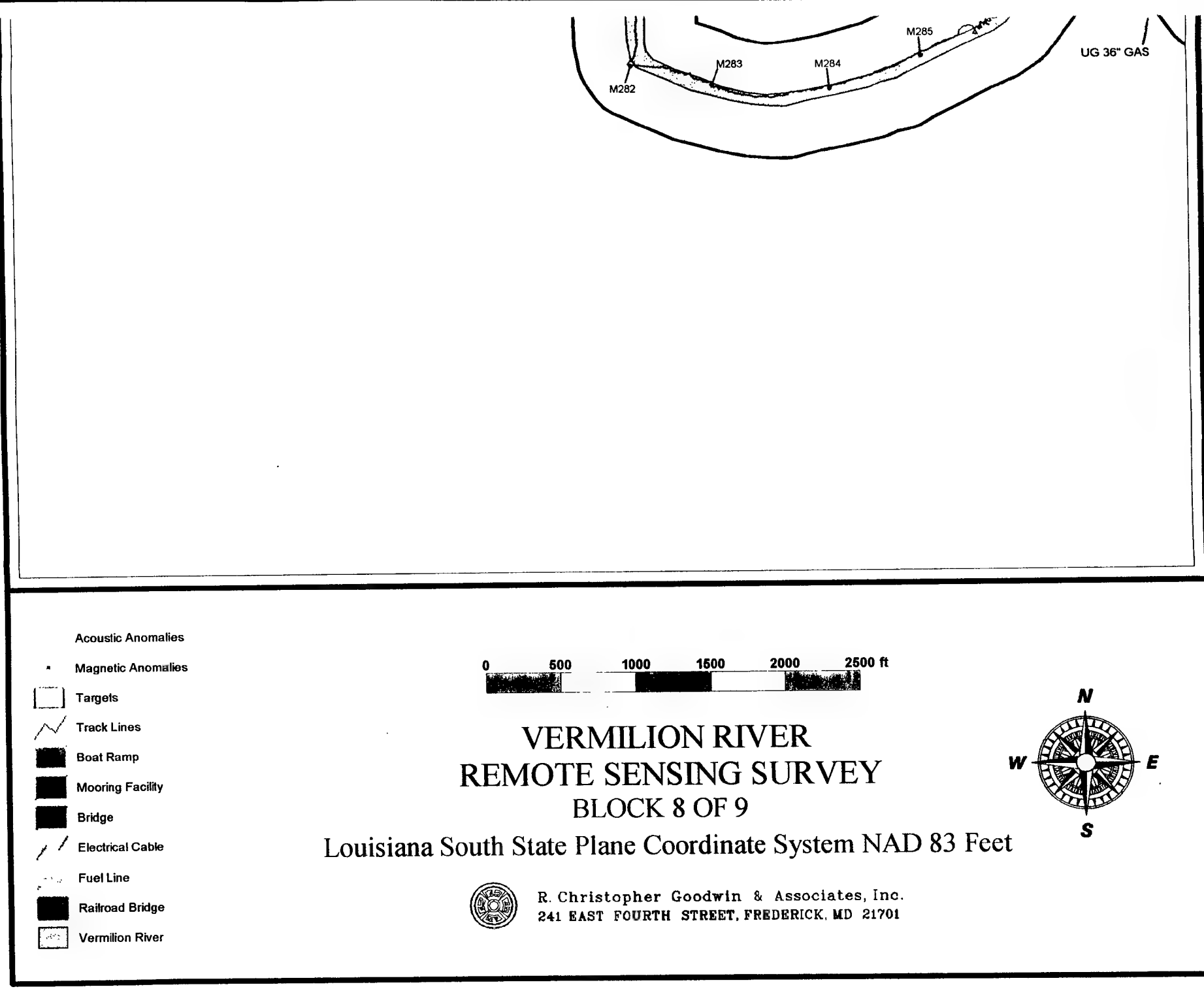
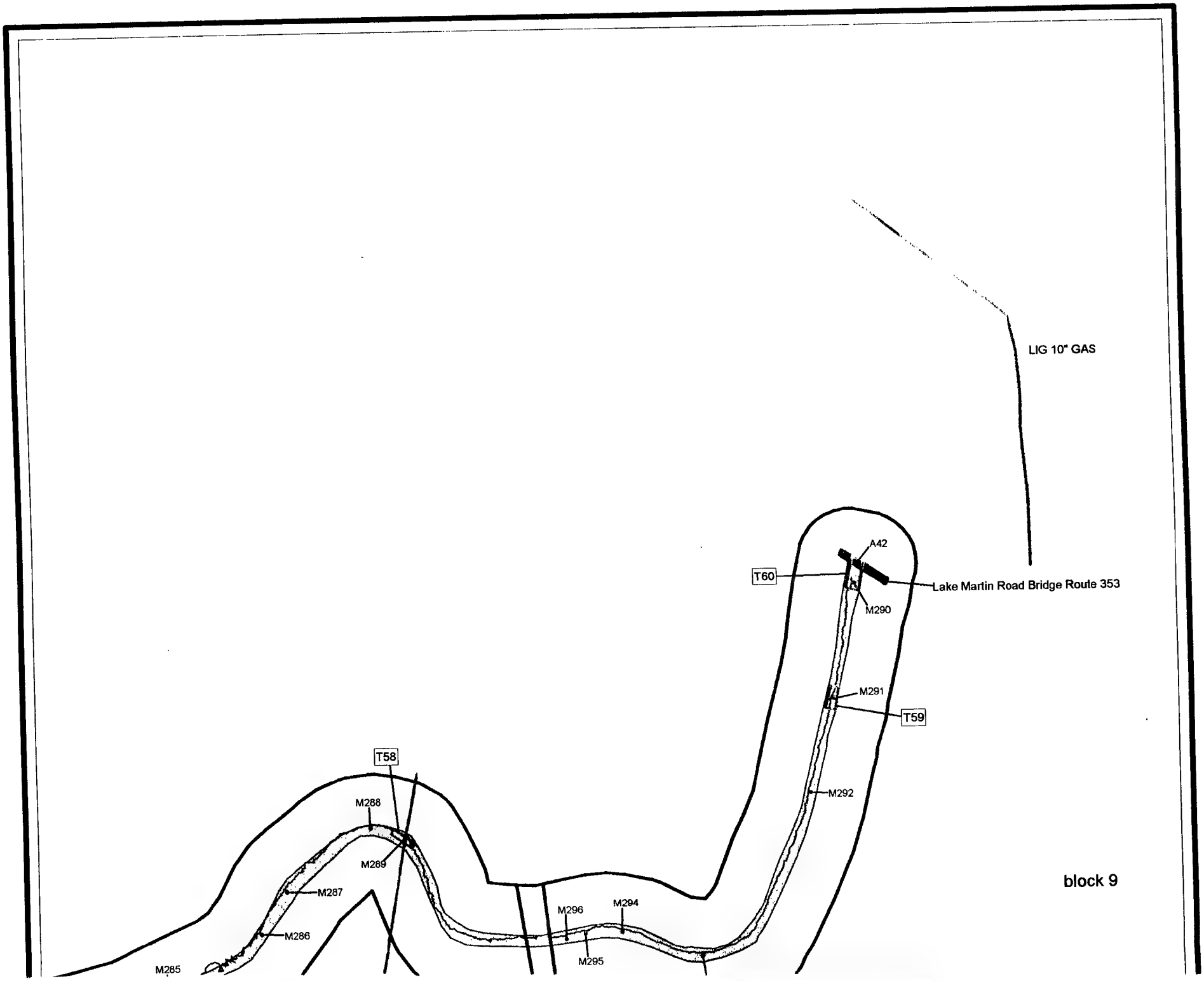


Figure 3h. Vermilion River Project area, showing survey blocks with tracklines, magnetic anomalies, acoustic anomalies, and targets


LIG 10" GAS
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T60
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T59
T58
M292
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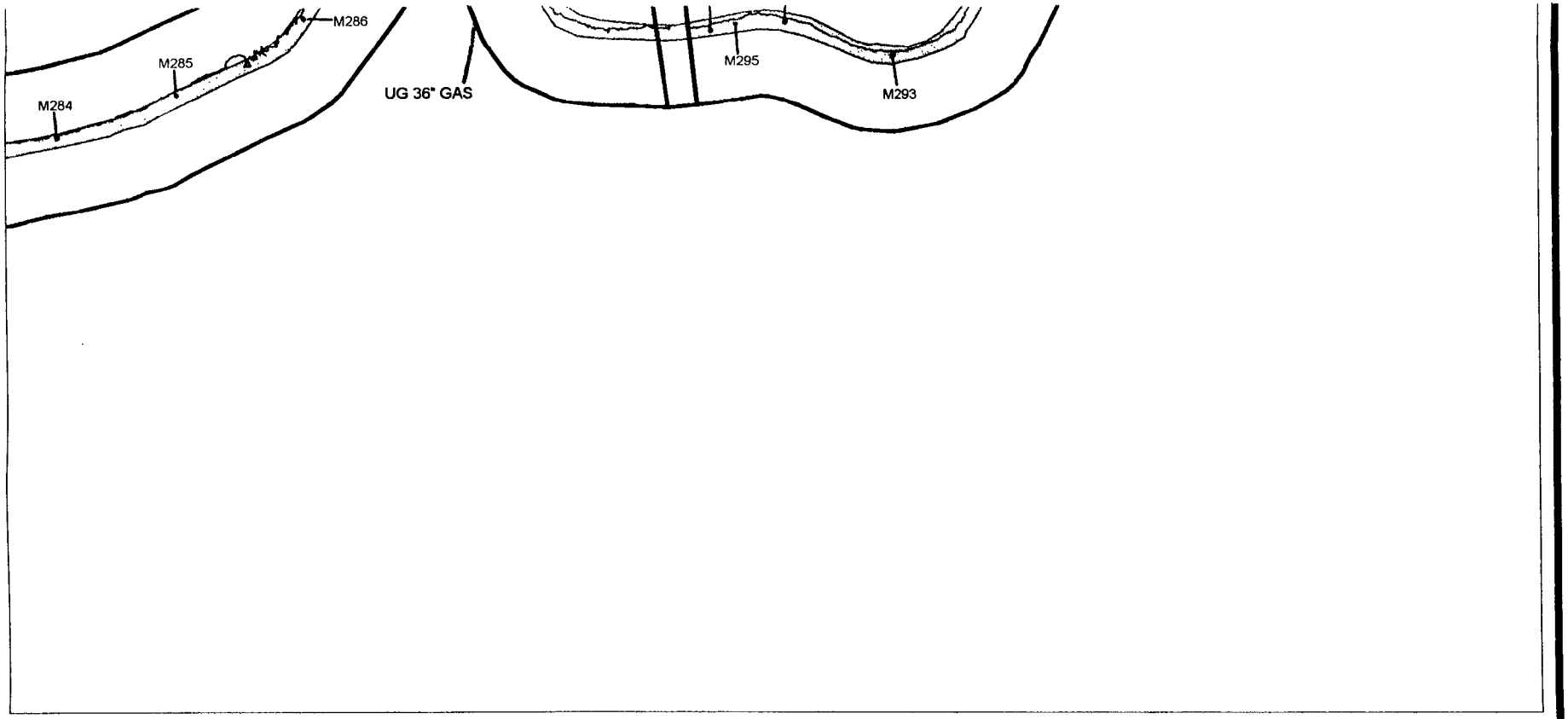

Acoustic Anomalies
Magnetic Anomalies
Targets
Track Lines
Boat Ramp
Mooring Facility
Bridge
Electrical Cable
Fuel Line
Railroad Bridge
Vermilion River

0 500 1000 1500 2000 2500 ft

VERMILION RIVER
REMOTE SENSING SURVEY
BLOCK 9 OF 9
Louisiana South State Plane Coordinate System NAD 83 Feet

N
W E
S

R. Christopher Goodwin & Associates, Inc.
241 EAST FOURTH STREET, FREDERICK, MD 21701

Figure 3i. Vermilion River Project area, showing survey blocks with tracklines, magnetic anomalies, acoustic anomalies, and targets

CHAPTER II

NATURAL SETTING

Introduction

Within the survey area, the Vermilion River flood plain and adjacent uplands are a product of a complex assemblage of natural processes that have changed in magnitude, frequency, and type over thousands of years of human occupation. These changes have resulted in a complex geomorphic history that likely has influenced the cultural history of the survey area and the preservation of archeological deposits created by its inhabitants.

Physiography

Two major physiographic terrains characterize the survey area. The survey area lies mainly in the valley and flood plain of the Vermilion River, the Vermilion River Valley terrain. The narrow valley of the Vermilion River is entrenched into the flat, gulfward sloping upland surface that forms the Prairie Terrace terrain.

Prairie Terrace Terrain

The uplands adjacent to the Vermilion River consist of the Prairie Terrace, a flat, poorly drained geomorphic surface that often exhibits relict fluvial topography. The Prairie Terrace, referred to as the "Beaumont surface" by Winker (1991) and DuBar et al. (1991), is a coast-parallel geomorphic surface that slopes gently gulfward at about 0.3-0.4 m/km (1.5-2 ft/mi). It ranges in elevation from sea level, where it disappears beneath the Holocene sediments comprising the Chenier Plain, to 30 m (100 ft) at its northern edge in Evangeline Parish. Typically, the relief on the undissected Prairie Terrace is low, ranging from 3 to 6 m (10 to 20 ft) (Jones et al. 1954:25-27).

Along either side of the Vermilion River, the Prairie Terrace exhibits two types of surface morphology. In the area mapped as the Beaumont Alloformation (Figure 4), the surface of the Prairie Terrace is relatively flat and featureless. Outside of the survey area, geologists, such as, Saucier (1994:224), Saucier and Snead (1989), and Winker (1991), either have recognized or mapped poorly-defined relict channels comparable in width and meander wavelength to those of the Red River on this part of the Prairie Terrace. In contrast, the easternmost edge of the Prairie Terrace exhibits subdued but well-defined ridge and swale topography and abandoned channels of the scale of an ancient and abandoned Mississippi River system (Jones et al. 1954:Plate 7; Saucier and Snead 1989). Such large-scale ridge and swale topography, abandoned channels, and meander loops characterize the area mapped as the Avoyelles Alloformation (Figure 4). The relict topography created by an ancient Mississippi River can be seen in the type area of the Avoyelles Alloformation between Mansura and Moncla, Louisiana, in Avoyelles Parish (Autin 1996; Autin et al. 1993:104-105; Fisk 1940:70).

Prairie Allogroup. The Prairie Terrace within the uplands bordering the Vermilion River is underlain by Pleistocene fluvial sediments of the Prairie Allogroup. When he informally subdivided the Pleistocene fluvial deposits of Grant and LaSalle Parishes on the basis of surface morphology, Fisk (1938:51-54) originally used "Prairie" as the name of the lowest and youngest of the Prarie

Allogroup's four "members." The term "Prairie" was derived from local names (e.g. the "Catahoula Prairie," "Holloway Prairie," and "Avoyelles Prairies") given to the flats that characterize "the lowest of a series of elevated flood-plain surfaces" in Grant and LaSalle Parishes (Fisk 1938:52). Fisk (1939:189-192) renamed his "Prairie member" the "Prairie Terrace," and used that term to designate the lowermost coast-parallel geomorphic surfaces within southwestern Louisiana and the Florida Parishes. Later, Fisk (1940, 1944) elevated his "Prairie member" from member to formation rank without producing a formal lithostratigraphic description. Since that time, subsequent workers have used, often interchangeably, either Prairie Terrace or Prairie Formation to designate both the terrace and fluvial sediments underlying it.

Autin et al. (1991:556-558) found that Fisk's Prairie Terrace (1939, 1944) consisted not just of a single geomorphic surface, but rather of a series of regionally distinctive constructional geomorphic surfaces of differing ages. They recognized that the individual geomorphic surfaces could be differentiated and mapped on the basis of differences in the slope, degree of dissection, and surface features. They argued that each individual geomorphic surface that forms a part of the Prairie Terrace constitutes the upper boundary of a package of sediments that are distinct from the sediments underlying other, even adjacent, geomorphic surfaces. The sediments underlying different geomorphic surfaces within the Prairie Terrace are separated by a major unconformity that often is associated with a prominent regional, buried soil called either "paleosols" or "geosols" (Autin et al. 1991:557; Autin 1996).

Saucier and Snead (1989) and Autin et al. (1991:556) renamed the "Prairie Terrace" and "Prairie Formation" the "Prairie Complex" to acknowledge the composite and allostratigraphic nature of the Prairie Terrace. More recently, Snead et al. (1998, 1999) revised the concept of the Prairie Complex to fit an allostratigraphic classification. In their revisions, the Prairie Complex is inferred to be an allostratigraphic unit of allogroup rank and, thus, renamed the Prairie Allogroup (Figure 5).

Within Louisiana, Snead et al. (1998, 1999) recognized two informal temporal phases of deposition within the Prairie Allogroup, the Late Sangamon, and the Early Sangamon. Within southwestern Louisiana, the Late Sangamon Prairie Allogroup contains the Avoyelles Alloformation. The Early Sangamon Prairie Allogroup contains the Beaumont Alloformation (Figure 5) (Heinrich 2000; Heinrich and Autin 1995; Snead et al. 1998, 1999).

Beaumont Alloformation. The Beaumont Alloformation is the oldest and topographically the highest of the Prairie surfaces that lie west of the Mississippi Alluvial Valley. Within southwestern Louisiana, the surface of the Beaumont Alloformation exhibits the relict channels of the Calcasieu, Sabine, Red, and other rivers, relict coastal ridges of uncertain origin, and the relict Ingleside barrier trend (Snead et al. 1998, 1999). Within the survey area, its surface consists of flat, featureless, loess-covered uplands that range in elevation from less than 7.6 m (25 ft) to just over 9 m (30 ft). Unlike the surface of the adjacent Avoyelles Alloformation, the surface of the Beaumont Alloformation lacks any obvious relict fluvial landforms within the immediate vicinity of the survey area.

Within this part of southwestern Louisiana, limited subsurface data discussed by Cancienne (1999:1350) indicate that the Beaumont Alloformation consists of a series of vertically stacked sequences of fluvial sediments. Each sequence consists of point bar, channel-fill, levee, crevasse splay, and flood plain deposits. The bulk of each sequence consists of channel deposits that are up to 18 m (60 ft) thick; these channel deposits typically encompass multiple fining-up sandy sequences that average 3 m (10 ft) thick. Lateral to the channel deposits, a sequence consists of finer grained crevasse and flood plain deposits. The upper part of an individual sequence consists either of marsh

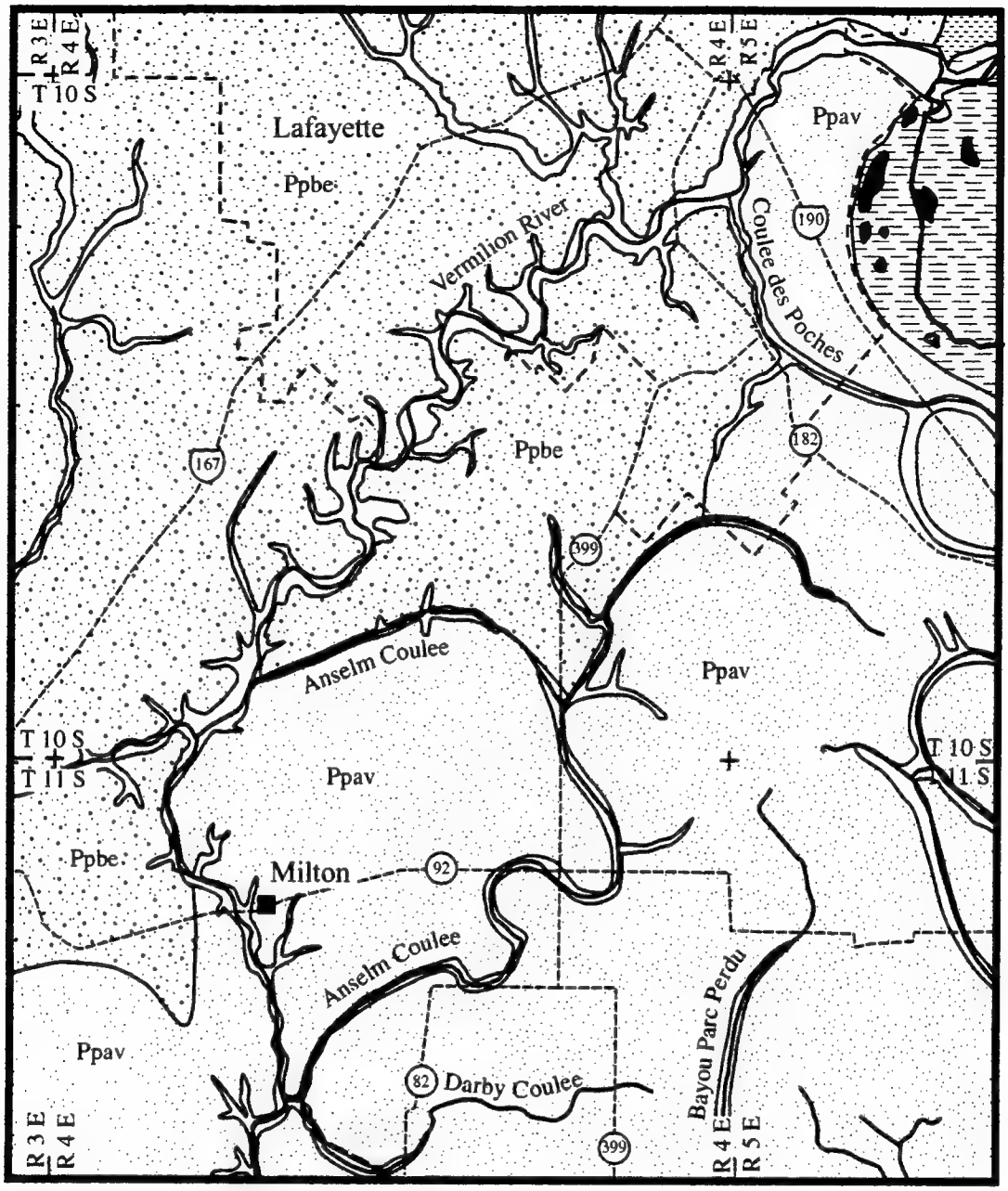

Figure 4. Geologic sketch map of the study area, compiled from Heinrich (2000) and Snead et al. (1997)

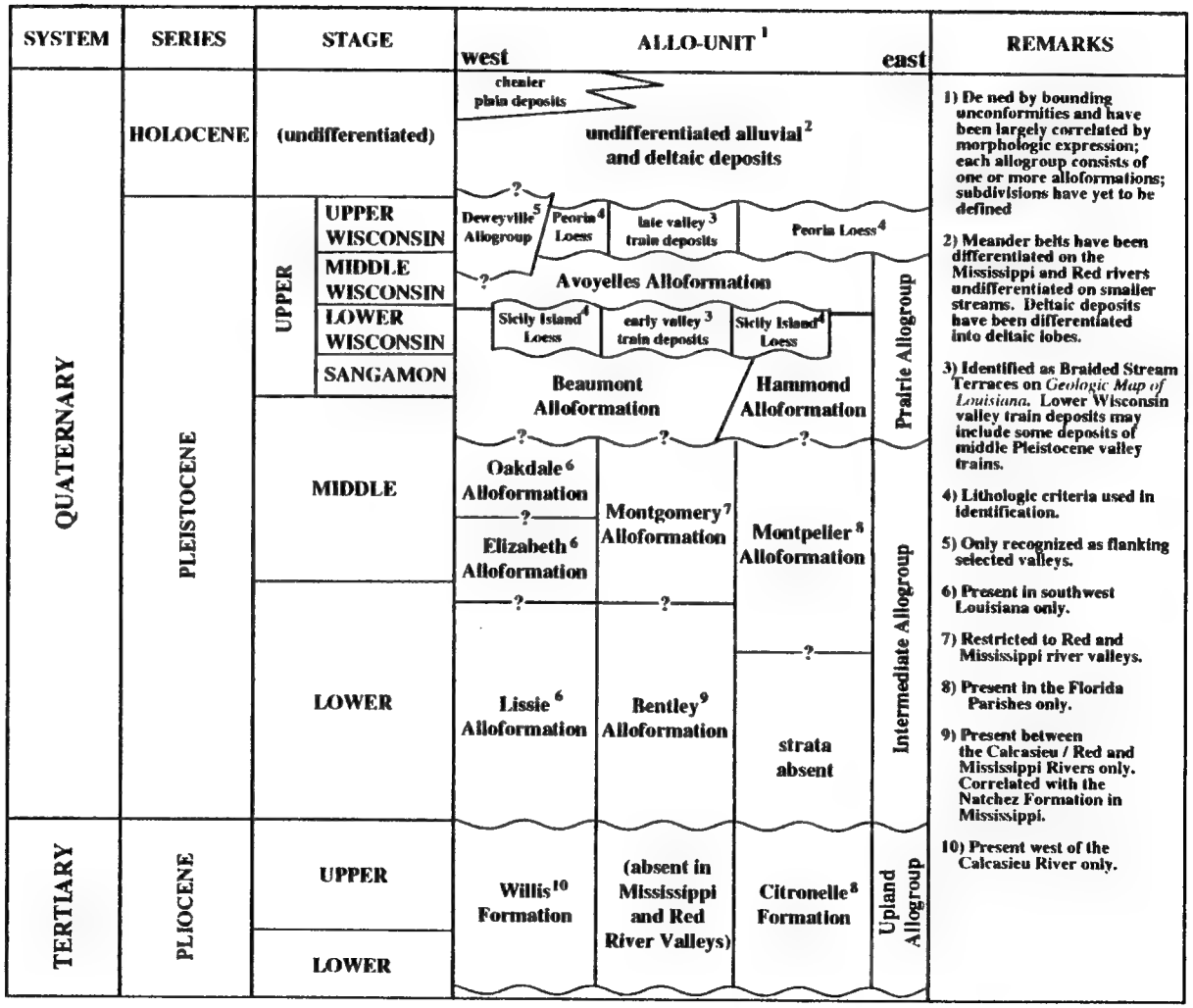

Figure 5. Stratagraphic chart of Quaternary units currently recognized by the Louisiana Geological Survey. Chart by Paul V. Heinrich, courtesy Louisiana Geological Survey

and estuarine sediments or thin, laterally persistent layers of clayey flood plain sediments. Locally, channels from an overlying sequence cut down into either the marsh, estuarine, or flood plain clays of the underlying sequence (Cancienne et al. 1999:1350). Aronow et al. (1991), Blum and Price (1993, 1998), and Winker (1979) have documented similarly stacked fluvial sequences within the Beaumont Formation, the equivalent of the Beaumont Alloformation, in southeastern Texas.

At this time, the sediments of the Beaumont Alloformation remain undated. In similar fluvial deposits comprising the equivalent Beaumont Formation in Texas, Blum and Price (1993, 1998) used thermoluminescence dating to determine that valley fills within it accumulated during Oxygen Isotope stages 5, 7, and 9. Thomas (1991) interpreted seismic data from southeastern Texas to show the presence of deposits of older oxygen isotope stages within the Beaumont Formation above the ca. 700,000 year old R6 regional reflector that marks it base. As summarized by Blum and Price (1993, 1998), there is sufficient evidence to conclude that the Prairie Allogroup consists of a complex assemblage of fluvial and deltaic deposits representing multiple glacial-interglacial sea-level cycles over the last 700,000 years. Within southwestern Louisiana, it appears that deposits and landforms created during the last interglacial highstands of sea level at either 120,000 B.P., or 130,000 to 135,000 B.P., or during both periods, comprise the entire surface of the Beaumont Alloformation (Saucier 1994:222-223).

Avoyelles Alloformation. The Avoyelles Alloformation consists of remnant meander belt deposits of a late Pleistocene Mississippi River that lie parallel to the western valley wall of the present Mississippi alluvial valley. The loess-covered surface of the Avoyelles Alloformation is characterized by constructional meander-belt morphology (Autin 1996; Autin et al. 1993:104-105; Fisk 1940:70).

The terrace surface within the area mapped as the Avoyelles Alloformation in Figure 4 exhibits prominent relict ridge and swale topography and abandoned river courses and meander loops. These relict fluvial landforms are comparable in size to those associated with the Holocene and modern meander belts of the Mississippi River. Local streams such as the Bayou Parc Perdue, Anslem Coulee, and Darby Coulee, now occupy many of the relict courses and meander loops present on the terrace surface. In the vicinity of the survey area, the surface elevation of the terrace ranges from less than 6 m (20 ft) in the bottom of abandoned channels occupied by modern streams to over 9 m (30 ft) along the crests of narrow ridges. Because the thickness of the loess cover increases to the east, the terrace surface rises in elevation towards the east.

The Avoyelles Alloformation consists of fluvial sediments similar to those associated with Holocene and modern meander belts of the Mississippi River (Autin 1996; Autin et al. 1993; Saxton 1983). In Lafayette Parish, Saxton (1986:29-32) found that the sediments of the Avoyelles Alloformation consisted of clays and silty clays identifiable as floodbasin deposits; thick, upward fining sands identifiable as point bar deposits; and interbedded sand, silt, and clay containing organic material identifiable as abandoned channel deposits. In its type area, the Avoyelles Alloformation consists of fluvial sand, silt, and clay deposited in point bar, channel, crevasse splay, and other fluvial sediment environments (Autin et al. 1993; Autin 1996).

The Avoyelles Alloformation has not been dated directly. It predates the start of the deposition of the Peoria Loess at about 25,000 B.P. and the deposition of the uppermost Beaumont Formation ending about 122,000 B.P. Since the meander belt surface of the Avoyelles Alloformation disappears beneath Holocene marsh, it apparently accumulated at a period of sea level lower than present, during the Middle Wisconsin Epoch prior to the last glacial maximum (Figure 5)(Autin et al. 1991: 558; Autin 1996).

Peoria Loess

Peoria Loess blankets the constructional topography that forms the surface of both the Beaumont and Avoyelles Alloformations. Alden and Leighton (1917) initially named it the "Peorian Loess," due to the numerous exposures of loess found in the vicinity of Peoria in Peoria County, Illinois. Leighton (1926) described a type section for the Peoria Loess on Farm Creek near Peoria, Illinois. Frye and Leonard (1951) changed Peorian Loess to its current usage, Peoria Loess (Willman and Frye 1970).

Peoria Loess consists of tan, brown, or dark brown, massive, well-sorted silt. It is thickest (about 4 m [13 ft]), adjacent to the western valley wall of the Mississippi River valley and rapidly decreases in thickness westward (Figure 6). Where the Peoria Loess is thickest, it can be calcareous and contains abundant terrestrial gastropods, vertebrate fossils, and numerous, dispersed calcareous nodules. The uppermost part of the loess is leached of carbonate because of the soils that have developed within it. The basal layer of the Peoria Loess consists of a basal mixing zone composed of loess and sediment from either the Avoyelles or Beaumont Alloformations (Miller et al. 1983, 1986; Saucier 1994).

The Peoria Loess is the youngest and most widespread of the multiple loess layers that have been mapped in the Mississippi Alluvial Valley. Within Louisiana, it occurs as a blanket that covers a belt 40 to 100 km (24 to 60 miles) wide along the eastern edge of the Mississippi River Valley and 0 to 55 km (0 to 34 miles) wide along segments of its western edge. The Peoria Loess forms the surface of the present landscape where it is present and has the modern soil developed in it. Within the survey area and this part of southwestern Louisiana, older loesses are absent, and the Peoria Loess rests directly on either the Avoyelles or Beaumont Alloformations (Miller et al. 1983, 1986; Autin et al. 1991:560, 571).

The Peoria Loess consists of wind-blown sediment that was carried by strong, Pleistocene glacial winds from the floodplain of the Mississippi River. During the deposition of the Peoria Loess, huge volumes of meltwater flooded the Mississippi, Missouri, and Ohio river valleys during the spring and summer, melting along the southern edge of Laurentide Ice Sheet. This flooding carried large quantities of glacial sediment down these valleys. The glacial sediments contained considerable quantities of fine-grained glacial sediment called "rock-flour." The ice sheets created the rock flour as they ground over bedrock. Spring and summer floods carried these sediments down these rivers and deposited the soils all across their flood plains. During the fall and winter, when the melting of the edge of the Laurentide Ice Sheet largely ceased, the voluminous meltwater down the Mississippi, Missouri, and Ohio rivers slowed considerably, leaving large areas of the flood plain high, dry, and unvegetated. Strong winds blowing across the newly exposed flood plains eroded silt and clay from them and carried it out of the alluvial valleys. Outside of the valley, the wind-blown dust eventually settled, accumulating as a blanket of loess that covered the surface of the Prairie Terrace. Autin et al. (1991:560) and Saucier (1994:133-134) estimate that Peoria Loess accumulated between 10,000 and 25,000 B.P.

Vermilion River Flood Plain Terrain

The other major geomorphic terrain within the survey area is the flood plain of the Vermilion River. It consists of a narrow valley cut down into the surface of the Prairie Terrace. The width of the Vermilion River valley varies from the width of the river (about 45 to 60 m [150 to 200 ft]), to 0.3 to 0.4 km (0.2 to 0.25 mi). The widest segments of the valley occur almost entirely within the inside of meander loops. From its junction with Coulee des Poches to its junction with the northernmost segment of Anselm Coulee, this terrain feature cuts directly across the loess-covered deposits of the Beaumont Alloformation. North of its junction with Coulee des Poches and south of its junction with the northern segment of Anselm Coulee, the Vermilion River occupies abandoned meander loops of the ancient Pleistocene–era Mississippi River (Figure 4).

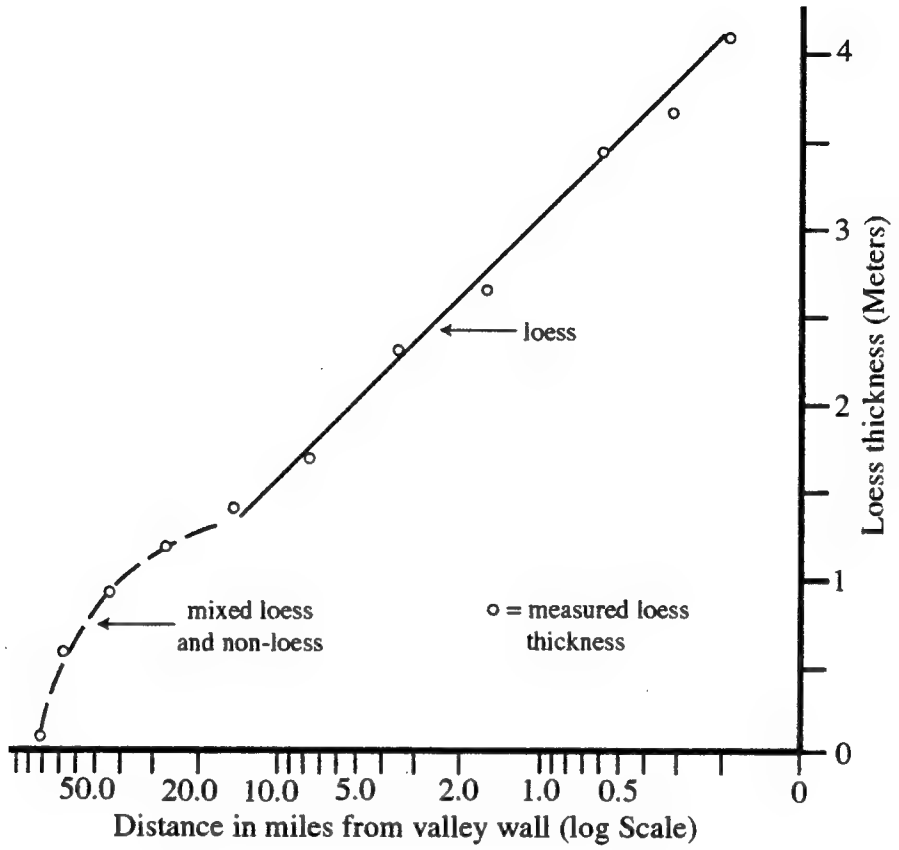

Figure 6. Variation in Loess thickness observed by Miller et al. (1983) in an east-west transect across Lafayette Parish, Louisiana (Redrawn from Miller et al. 1984:50)

The flood plain of the Vermilion River is restricted by the relatively narrow width of the valley that it occupies. In the northern part of the survey area, it lies from 4.6 to 6 m (15 to 20 ft) in elevation above mean sea level (AMSL); below the edge of the terrace, its elevation ranges from 7.6 m (25 ft) to over 9 m (30 ft). Farther south, the flood plain is very narrow and drops to below 4.6 m (15 ft) AMSL; the terrace lies at an elevation of just over 7 to 7.6 m (20 to 25 ft).

According to Foram (1991:40-41), multiple layers of alluvium underlie the floodplain of the Vermilion River. The uppermost layer consists of dark brown to gray silty clays and clays. These sediments represent both natural levee and flood plain deposits of the Vermilion River, and also include material dredged in historic times from the bed of the river. The descriptions of parent material for the Udifluvents that characterize this terrain (Murphy et al. 1977:20-21) implies that the surface of the modern flood plain is covered largely by historic spoil resulting from the repeated dredging of the Vermilion River.

A second unit, composed of reddish-brown to red to reddish-yellow silt and sandy clay interlayered with clay and fine sand underlies the uppermost dark brown to gray silty clays and clays. Foram (1991:40) and Saxton (1983:37-38) interpreted these sediments as having come from the Red River; they argued that the sediments accumulated when the Vermilion River functioned as a distributary of the Red River, while it occupied Bayou Teche.

Underlying the Red River deposits is a third unit composed of dark gray to gray and brown silty sand and sand. Foram (1991:41) has interpreted these deposits as sediments that also accumulated along the Vermilion River while it functioned as a distributary of the Mississippi River, when it occupied Bayou Teche. Unfortunately, Foram (1991:40-41) does not mention either the thickness of these units or what lies below the deposits of the Teche-Mississippi River.

The age of these fluvial deposits is poorly understood. Saxton (1983:38, 115) reported a date of 5,510±100 years B.P. (c-11g) obtained from shell found in Core 11 from the lowest layer of pre-Red River deposits. This date is consistent with the lowermost layer of sediment, deposited from the Teche-Mississippi River valley before the Mississippi River abandoned it about 3,800 B.P. as part of Meander Belt No.3 (Saucier 1994:255). This radiocarbon date also is consistent with that derived for the reddish colored sediments carried from the Red River when it occupied Bayou Teche between 3,800 and 1,800 B.P.

Soils

Within the project area, the soils are closely related to parent materials. The soils associated with the surface of the Prairie Allogroup are characterized by soil series that have profiles developed in a loess parent material as the result the weathering of Pleistocene Loess during the Holocene era. In contrast, the flood plain of the Vermilion River is characterized by soils with less well-developed profiles that have formed in Holocene alluvium.

Prairie Terrace Terrain

Within the region of the survey area, the loess-covered uplands of the Prairie Terrace Terrain are characterized by the Coteau, Memphis, Patoutville, and Frost silt loams. Frost silt loam is prevalent in the poorly drained swales and drainages, many of which are frequently flooded. Coteau, Memphis, and Patoutville silt loams are associated with the higher, better-drained areas like crests and sideslopes of ridges. Memphis silt loam is found adjacent to the valley wall. Coteau silt loam is most abundant immediately west of where Memphis silt loam is found. Farther west, the terrace is dominated by Patoutville silt loam. As shown in Figure 7, the distribution of these soils reflects the thickness of the Peoria Loess. Where the loess is thickest, adjacent to the valley wall, Memphis silt loam is dominant. Farther west, as the loess thins, Coteau silt loam becomes more abundant. Finally, as loess is replaced by loess mixed with underlying alluvium, Patoutville silt loam becomes the prevalent soil series.

The above soils are all alfisols. Alfisols are soils with a light-colored surface horizon called an "albic horizon," a subsurface layer of concentrated clay called an "argillic horizon;" and moderate or high base saturation. The degree of horizon development in these alfisols indicates that they are mature soils that have been developing on a stable landscape for thousands of years (Murphy and Libersat 1996; Murphy et al. 1977; Soil Survey Staff 1975).

Frost and Patoutville silt loams are both Aqualfs. These are soils that are completely saturated with water for most of the year on a seasonal basis. Frost silt loam is very poorly drained because it lies within swales, depressions, drainages, and other low parts of the landscape. Patoutville silt loam is poorly drained because of its impermeable clayey parent material. The clay reflects the mixing of clayey alluvium from the underlying Prairie Allogroup into the loess; the farther away from the valley wall, the finer and more clayey the loess becomes.

Vermilion River Flood Plain Terrain

Both Murphy et al. (1977:20-21) and Murphy and Libersat (1996:54) mapped the narrow Vermilion River flood plain as undifferentiated Udifluvents. Both of these authors specifically described the parent material of these Udifluvents as sandy, clayey, or loamy sediments that were dredged from the Vermilion River during construction and maintenance of navigation channels. Their descriptions and maps imply that except for scattered areas of soils subject to flooding, the entire surface of the Vermilion River flood plain consists largely of spoil that blankets the former surface of the flood plain.

Udifluvents are entisols developed in fluvial sediments. Entisols are soils that evidence little development. They lack development of any soil horizons except the A horizon; segregation of clay, carbonates, sulfates, and other minerals by physical translocation due to soil processes is absent. They also exhibit alteration by weathering of minerals and disturbance or mixing of the original structure of the parent material. The lack of the normal alteration of sediments that characterizes a soil profile reflects the very recent accumulation of these sediments (Soil Survey Staff 1975).

Geologic History

The geologic evolution of the survey area begins with highstands of sea level of the last interglacial epoch that occurred between about 120,000 and 130,000 to 135,000 years ago. At this time, the Mississippi and Red rivers had constructed a broad coastal plain on which they flowed separately into the Gulf of Mexico. The course of the Red River was shifting back and forth across southwestern Louisiana, creating numerous meander belts and blanketing large areas with Red River alluvium (Saucier 1994:226-227).

After 120,000 B.P., sea levels fell as ice sheets either formed or grew worldwide. As sea level fell, the Mississippi River cut deeply into the existing coastal plain. The valley that it created destroyed its interglacial meander belt and captured the Red River. As a result, the Mississippi and Red rivers abandoned their interglacial coastal plain, thereby creating a terrace surface with relict landforms such as the abandoned courses of the Red River and the Ingleside island chain. Deposition of the Beaumont Alloformation also ceased at this time.

Between 25,000 and 120,000 B.P., sea levels rose and fell several times by many tens of meters. The Mississippi River undoubtedly repeatedly filled in and eroded out its valley in response to these changes in sea level. At some time during this interval, sea level was sufficiently high that the Mississippi River filled in its valley close to the level of the interglacial coastal plain. At this time, its course shifted so far to the west that its meander belt migrated into the Lafayette area and cut out the older deposits of the Beaumont Alloformation. This lateral migration of the Mississippi River created the pattern of well-defined ridge and swale topography, meander loops, and river courses that marks the surface of the Avoyelles Alloformation, and deposited the sediments that comprised it. Sea levels eventually dropped, causing the Mississippi River to cut deeply again into its coastal plain. This surface was abandoned and partially

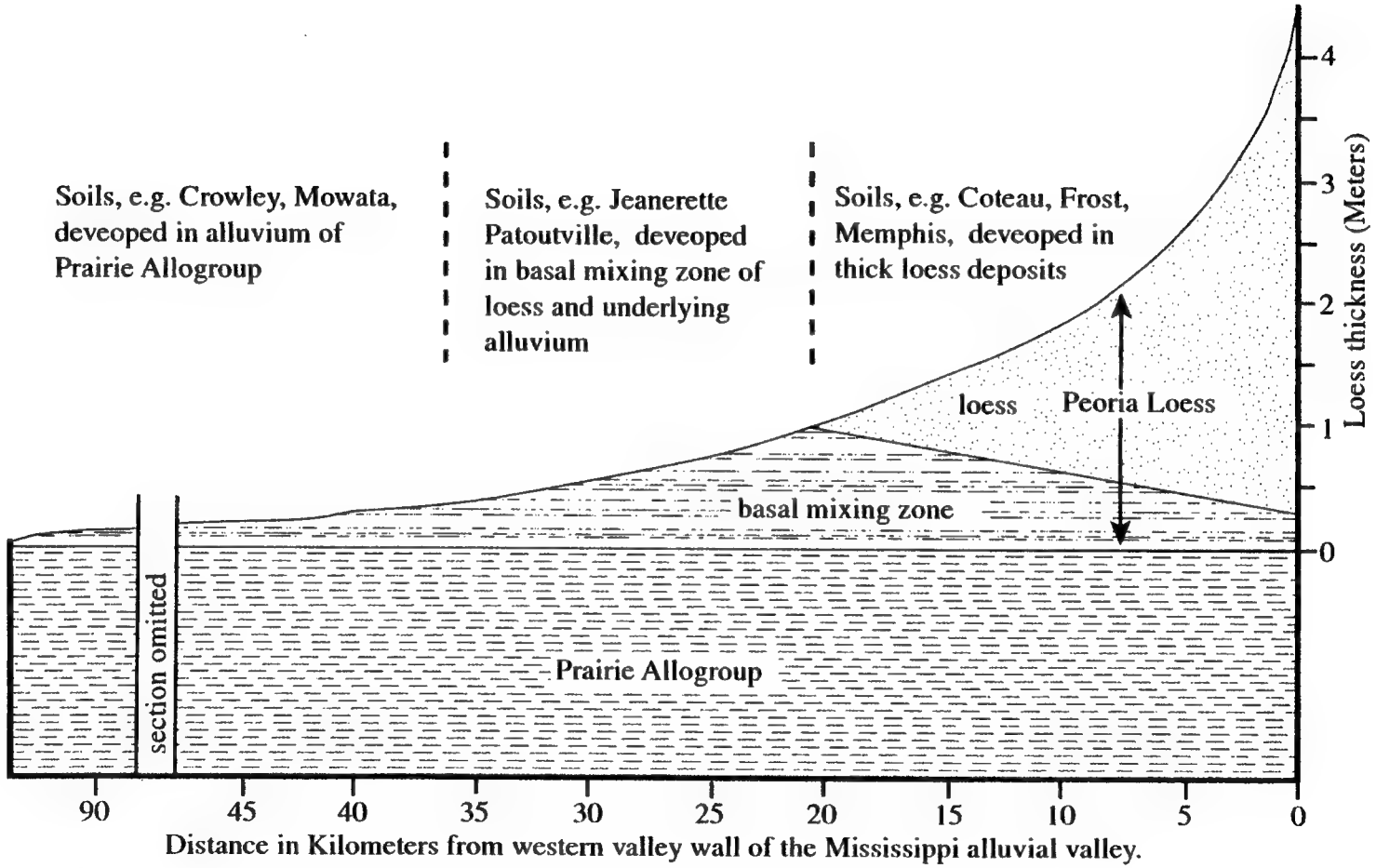

Figure 7. Schematic relationship between modern soils and loess thickness within the Lafayette-Crowley, Louisiana region (Redrawn and modified from Miller et al 1984:51)

destroyed leaving the Avoyelles Alloformation and its relict fluvial landforms behind.

During the last time that continental ice sheets advanced across North America, called the "Last Glacial Maximum," large volumes of glacial meltwater flowed down the Mississippi River from the Laurentide Ice Sheet. The meltwater carried large quantities of glacial sediment and spread it over the floor of the Mississippi River Valley. During the winter and fall, when the meltwater rivers were largely dry, winds eroded silt and clay from the flood plain, transported these out of the flood plain, and deposited them as loess on the uplands on either side of the Mississippi Valley. Starting about 25,000 years ago, the accumulation of windblown dust buried the surfaces of the Avoyelles and Beaumont Alloformations beneath a thick layer of loess within the survey area. By the end of loess deposition about 12,000 B.P., the current upland topography had been created, except for the stream and river valleys that have since cut into it and minor modifications due to colluvial processes.

It was also during the last glacial maximum that sea level fell by about 115 m (377 ft). As a result, not only did the Mississippi River cut deeply into the coastal plain, but other coastal rivers, including the Vermilion, did the same thing. Presumably, it was at this time that the Vermilion most likely downcut and created its present valley (Saxton 1983:50). The Vermilion River followed, for the most part, ancient abandoned channels of the Mississippi River. Within the survey area, it cut directly across the surface of the Beaumont Alloformation and nearly breached the western valley wall of the Mississippi River Valley. The mechanics of this process, what caused the river to take this course, and the chronology of the formation of this segment of its course are poorly understood.

During the Late Pleistocene, when the Laurentide and other ice sheets melted, water drained back into the oceans, causing them to rise rapidly. As a result, the Mississippi and other coastal rivers started to aggrade their flood plains. By the early Holocene, ca. 10,000 to 9,000 B.P., the Mississippi had built up its valley floor close to its present level, and also had established a meander belt along the western side of its Mississippi alluvial valley (Saucier 1994). At some time during the Late Pleistocene or Early Holocene, the Vermilion River presumably started to fill the valley that it previously had cut during the low sea levels of the last glacial maximum.

Lateral migration of the Mississippi River cut back its valley within the Lafayette area. As a result, the divide between the Mississippi and Vermilion River was breached and the Vermilion River extended its course onto the Mississippi River flood plain. During the early Holocene, a crevasse channel, which funneled floodwaters out of the active Mississippi River course, developed to the northeast. This channel merged with the Vermilion River and converted it to a distributary of the Mississippi River when occupied Bayou Teche. Until 3,800 B.P., when Mississippi River abandoned its Bayou Teche course, floodwaters from the Mississippi River regularly flowed down the Vermilion River (Foram 1991:53-54; Saxton 1986:54-55). The Mississippi floodwaters of this period deposited within the Vermilion River Valley the lowermost fluvial sediments that were described by Foram (1991:40-42).

About 3,800 B.P., the Mississippi River abandoned Bayou Teche for a course on the eastern side of its alluvial valley; however, the Red River continued to flow through Bayou Teche until about 1,800 B.P. During this time, the Vermilion River acted as a distributary of the Red River during periods of flooding. In the process, the reddish colored sediments described by Foram (1991:40-42) accumulated within the Vermilion River valley.

At about 1,800 B.P., the Red River abandoned Bayou Teche, and thereafter the Vermilion River ceased to be a distributary channel for Red River floodwaters. Instead, the Vermilion reverted to a minor river that drained a local backswamp of the Mississippi River valley, and became distant from the influence of any major river system. Except for disturbance by navigation improvements, the Vermilion became the river system that it is today (Saxton 1986:55-56; Foram 1991:54-

55). During this last phase of its evolution, some accumulation of sediments apparently occurred within the Vermilion River. These sediments formed the fluvial deposits noted by Foram (1991:40-41) to be overlying the reddish colored sediments of Red River origin.

Geoarcheology

The potential for the preservation and occurrence of archeological sites within the survey area varies greatly according to the geomorphic terrain. Within the uplands of the Prairie Terrace terrain, the general potential for buried sites is almost nonexistent and disturbance great. Within the flood plain of the Vermilion River, the potential for the occurrence of buried sites is high, and it is possible that some of these sites might be well preserved.

Prairie Terrace Terrain

The surface of the Prairie Terrace terrain has been stable and has not received any significant amount of sedimentation for the last 12,000 years. As result, any cultural materials left on its surface would remain there unless buried either by human activity or by bioturbation. As a result, only surface sites are expected to occur within the Prairie Terrace terrain. The cultural deposits in these sites most likely would be restricted to the upper part of the solum of the modern soil profile into which they have been either churned by pedogenic processes or farming practices, or buried by humans. A limited amount of sediment accumulation and burial of archeological materials may have occurred only in the bottoms of the swales and drainges.

Any sites found in the Prairie Terrace terrain probably are poorly preserved, because surface sites and archeological deposits would be affected by any surface disturbance. The surface of the Prairie Terrace has been impacted by rice agriculture, and construction of roads, buildings, and ditches. The stability of the surface of the Prairie Terrace terrain not only allows for greater mixing of different age components within archeological sites as a result of bioturbation and other pedogenic processes, but also encourages severe weathering of archeological artifacts and remains.

Finally, the soils within the survey area are developed in deeply weathered loess. Weathering of these loess deposits over the last several thousand years has removed their original carbonate content (Foram 1991:36). As a result, the soils in the survey area range from slightly to very acidic (Murphy et al. 1977). Such acid soils would not be conducive to the preservation of bone (Retallack 1983).

Vermilion River Flood Plain Terrain

The flood plain of the Vermilion River potentially presents a greatly different setting for the occurrence and preservation of archeological sites. As noted by Foram (1991), sediments dating back as far as 6,000 B.P. occur beneath the Vermilion River flood plain. Thus the river's flood plain has been aggrading likely episodically, for the last 6,000 years.

The history of aggradation provides an environment for preserving buried archeological deposits within the Vermilion flood plain terrain. Archeological deposits on former flood plain surfaces potentially have been buried and preserved within the overbank sediments that underlie them. In general, the degree of preservation of such archeological deposits depends on how fast they were buried after their formation (Ferring 1986). At present, there is insufficient information to determine how deeply archeological sites might be found beneath the flood plain of the Vermilion River.

It also is unclear how badly previous dredging of the Vermilion River and disposal of spoil have disturbed the historic surface of the river's flood plain. Moreover, it also is unknown how deeply any disturbances of the flood plain sediments have effected the underlying alluvium. Murphy et al. (1977) and Murphy and Libersat (1996), in their descriptions and mapping of Udifluvent areas, indicate that nearly the entire flood plain surface within the survey area has been disturbed, even though the effects of such disturbances are unknown.

Natural Environment

The entire survey area lies within what was the Cajun Prairie, an outlier of mesic coastal prairie in Louisiana that exists within a climate that normally supports forest. This natural tallgrass prairie exists because the soils are poorly drained and impermeable. As a result, these soils have a poor water-yielding capability that induces summer droughts that are severe enough to seriously limit tree growth (Fearn 1995). Within the Cajun Prairie, gallery forests occurred only along the major rivers and streams of southwestern Louisiana.

Flora

Very little is known about the original flora of the Cajun Prairie because this region never was studied in detail before it was virtually destroyed during historic times. When he visited southwestern Louisiana in 1869 to 1872, Samuel Lockett estimated that the Cajun Prairie originally occupied some 2.5 million acres. Currently, less than one per cent (some 200 acres) of native Cajun Prairie remains; the rest has been converted to cattle pasture, rice fields, and cane fields. The remnant patches of Cajun Prairie exist within narrow strips along railroad rights-of-way (Hobaugh et al. 1989; Soileau 1996).

What remains of the Cajun Prairie consists of patches of dense, tall grasses interspersed with large fields of perennial flowers and other plants. The dominant grasses are big bluestem (*Andropogon gerardii*), switch grass (*Panicum virgatum*), Indian grass (*orghastrum nutans*), slender bluestem (*Schizachyrium tenerum*), little bluestem (*Schizachyrium scoparium*), broomsedge (*Andropogon virginicus*), and Florida paspalum (*Paspalum floridanum*). In addition to the grasses, approximately 500 other species of plants also have been recorded. These include coneflowers, brown-eye susan (*Rudbeckia triloba*), Coreopsis, blazing stars (*Liatris spp.*), compass plants (*Silphium laciniatum*), false indigos (*Baptisia tinctoria* and *B. australis*), partridge pea (*Chamaecrista fasciculata*), beebalms (*Monarda spp.),* prairie parsley (*Polytaenia nuttallii*), and milkweed (*Asclepias spp.)*(Hobaugh et al. 1989; Soileau, 1996). The floral community in marshy spots in the prairie may have been similar in composition to that found in modern freshwater marshes of the coastal zone as described by Penfound and Hathaway (1938:15)(Weinstein et al. 1979:4-5).

Gallery forests occupied the flood plains along the Vermilion River and other streams within the Cajun Prairie. The flood plain likely was occupied by hardwood forests that included blackjack oak (*Quercus marilandica*), post oak (*Quercus stellata*), white oak (*Quercus alba*), and hickory (*Carya sp.*). Other trees present would likely include sweetgum (*Liquidambar styraciflua*), sycamore (*Platanus occidentalis*), walnut (*Junglans nigra*), ash (*Fraxinus sp.),* cottonwood (*Populus deltoides*), and others. The permanently waterlogged parts of the flood plain would contain cypress (*Taxodium distichum*) swamps. The gallery forests along the watercourses may reflect not only different and wetter soils associated with these streams and rivers, but also a decrease in the frequency and intensity of fires in the wet bottomlands (Fearn 1995:34).

Fauna

The type of habitat offered originally by the Cajun Prairie and the fauna formerly associated with it are poorly understood. The fauna consists primarily of insects, birds, and small mammals. The eastern cottontail (*Sylvilagus floridanus*) currently is found in remnants of its grassy meadows. Other small prairie species may have included the cotton rat (*Sigmodon hispidus*) and prairie vole (*Microtus ochrogaster*). Lowery (1974:502) reported the occurrence of Bison (*Bison bison*) within Louisiana.; if so, this species may have lived in the southwestern prairies (Weinstein et al. 1979:4-6). The Cajun Prairie also hosts a diverse variety of birds. For example, it typically has the highest winter densities of Red-tailed Hawk (*Buteo jamaicensis*), Northern Harrier (*Circus cyaneus*), White Ibis (*Eudocimus albus*), and White-faced Ibis (*Plegadus chihi*) of any region in the US. It is also home to a diverse assemblage of waterfowl, sandpiper, and other shorebirds

during the fall, winter, and spring months, and is a crucial stopover area for these species (Hobaugh et al. 1989).

The fauna of the gallery forests would have been more varied than the fauna that occupied the grasslands of the Cajun Prairie. Species of interest as game to prehistoric hunters would have included deer (*Odocoileus virginianus*), swamp rabbit (*Sylvilagus aquaticus*), squirrels (*Sciurus spp.),* raccoon (*Procyon lotor*), beaver (*Castor canadensis*), wild turkey (*Meleagris galopavo*), quail (*Colinas viriginianus*) and various ducks. In the fall and early winter, the gallery forests also would have provided various nuts and seeds such as acorns, walnuts, and hickory nuts (Weinstein et al. 1979:4-6 to 4-8). The swampy portions of the Vermilion River could have provided significant resources for prehistoric inhabitants such as river otter (*Lutra canadensis*), beaver (*Castor canadensis*), and various turtles and snakes. The Vermilion River would have been a major source of fish.

Paleoenvironments

Nothing is known directly of the flora of the survey area during the Pleistocene. Although an intensive search for sites that might contain a Pleistocene-era paleo-environmental record for southwestern Louisiana has been conducted, no sites from which such data can be recovered have been found.

What little that is known about the Holocene history of the Cajun Prairie comes from research conducted by Fearn (1995), who studied pollen, phytoliths, charcoal, diatoms, and sediments obtained from cores from Lake Arthur and Prien Lake in southwestern Louisiana. The cores from both lakes, which lie within estuaries, provided a 6,000 year long record of late-Holocene vegetation history with the Cajun Prairie. Her analysis indicated that the grasslands of the Cajun Prairie have neither expanded nor contracted over the last 6000 years. Fearn (1995) also concluded that fire had been a significant factor in the maintenance of the Cajun Prairie. The pollen from these cores also showed that pine (*Pinus*), oak (*Quercus*), and cypress (*Taxodium*) have been components of southwestern Louisiana's vegetation for at least the last 6,000 years, with a minor increase in pine from 2,000 to 1,000 years B.P.

Climate

The region in which the northern Vermilion River lies has a humid, subtropical climate that characterizes the Louisiana coastal plain bordering the Gulf of Mexico. Being only about 77 km (48 miles) from the shoreline of the Gulf of Mexico and 48 km (30 miles) from the shoreline of Vermilion Bay, this region is dominated by subtropical humid air masses from the Gulf of Mexico. Drier air from continental air masses from the north and west influence the weather of this region only periodically (Grymes 1994).

During the summer, temperatures can be hot. Between June and early September, daytime maximums temperatures typically average 90°F (32°C) or above; however, these generally are lower than those recorded further inland. Daytime maximum temperatures above 100°F (38°C) do not occur every year. When they occur, they occur in two or more days in a row. According to data for the years 1941 to 1970 from Lafayette, Louisiana, the hottest months of the years are June, July, and August, which each average 90°F (32°C). For both July and August, the average daily minimum temperature for this period is 72°F (22°C). As in the winter, summer maximum and minimum temperatures usually show a range of 19°F (11°C)(Murphy et al. 1977:56; Grymes 1994).

Around Lafayette, winter temperatures are generally very mild, and average winter monthly minimum temperatures are all above freezing. However, cold spells of sub-freezing weather and rare periods of sub-freezing weather can occur with polar outbreaks. The duration of such cold weather spells is typically short; in rare winters, they might last as long as several days but no longer. The coldest months are December and January, which for the period 1941 to 1970 at Lafayette, Louisiana, respectively had an average daily maximum temperatures of 64°F

(18°C) and 62°F (17°C). For December and January, respectively, average daily minimum temperatures for this period were 44°F (6.6°C) and 42°F (5.5°C)(Murphy et al. 1977:56; Grymes 200).

In the Lafayette region, precipitation occurs throughout the year. Between 1961 and 1990, measurable rainfall was recorded on 110 days of an average year. Although rainfall is reasonably well distributed throughout the year, the spring and fall tend to be the drier months. According to data from Lafayette, Louisiana for the period 1941 to 1970, the driest months of the years are October and November, with an average monthly precipitation of 3.4 inches (8.6 cm) each. The wettest month is July, with an average monthly precipitation of 7.0 inches (18 cm)(Murphy et al. 1977:56; Grymes 2000).

The majority of the rainfall in the Lafayette region results from frontal storms. The rainfall associated with cold fronts, which occurs throughout the year, is most frequent during the winter and spring. Snow and sleet associated with these winter frontal storms is possible, but very rare. Thunderstorms also produce precipitation throughout the year, but most commonly during the summer. Frontal thunderstorms and squalls, which occur most frequently during the spring and fall, may cause locally heavy rainfall, regional flooding, high winds, dangerous lightening, hail, and tornadoes. Hurricanes can cause very intense rainfall that results in heavy regional flooding. On the average, about 61 inches (155 cm) of rain fall per year, with as much as 91 inches (231 cm) or as little as 39 inches (99 cm) in any year (Grymes 2000).

CHAPTER III

PREHISTORIC AND HISTORIC SETTING

Vermilion River Area Prehistory

The prehistoric era of the Vermilion River study area covers a time period extending from ca. 12,000 B.C. – A.D. 1700, and can be divided into eight major cultural units: Paleo-Indian, Archaic, Poverty Point, Tchefuncte, Marksville, Troyville-Coles Creek, Plaquemine, and Mississippian (Jeter et al. 1989; Smith et el. 1983). These cultural units are distinguished by examining patterns of subsistence and technology over the given geographic region of the Vermilion River survey area, a region noted for its swampy lowlands in its south and its wooded southern pine forests that become increasingly predominant as one progresses north.

The Paleo-Indian Stage of Louisiana prehistory covers a time period roughly between 10,000 and 8,000 B.P. The Paleo-Indians, who lived in small groups as highly mobile hunter-gathers, are distinguished from the later Archaic period by their distinct lithic assemblages.

The people of the Archaic period (ca. 6,000 to 1,550 B.C.) grouped into semi-sedentary populations noted for their projectile point/knife morphology. In Louisiana, the Archaic period ended with the Poverty Point Culture (ca. 2,000 - 500 B.C.). The Poverty Point Culture was notable for its large earthworks and its complex microlithic industry.

The third major phase of prehistory in the Vermilion River area began with the Woodland Stage (ca. 500 B.C.- A.D. 1000). The Woodland Stage is subdivided into the Early Woodland, with its distinguishing Tchefuncte culture (ca. 500 B.C. - A.D. 300); the Marksville culture, which often exemplifies the Middle Woodland Period; and the Late Woodland period, dominated by the Troyville-Coles Creek culture. Differences in earthworks, lithic traditions, and ceramic styles and types distinguish these cultural groups.

Archeologists have divided the final stages of prehistoric occupation into the Plaquemine and Mississippian cultures. The emergence of the Late Woodland Troyville culture often is viewed as a transitional culture to the later Mississippian culture, which was noted for cultivation of various crops and its highly organized and stratified social system. Mississippian and Plaquemine cultures were present ca. A.D. 1200 - 1700.

The above is a brief description of the prehistoric cultural sequence of the Vermilion River study area. For additional information on Louisiana's prehistory, *viz* R. Christopher Goodwin and Associates, Inc.'s report, *Phase I Cultural Resources Survey and Inventory of the Proposed Vermilion River Dredge Maintenance Project, Lafayette Parish, Louisiana* (Athens et al. 1999:26).

Vermilion River Area History

Introduction

The project corridor consists of a stretch of the Vermilion River that bisects Lafayette Parish, extending from the Louisiana Highway 353 bridge located northeast of Lafayette, downstream through that city, and ending at the Louisiana Highway 92 bridge in the community of Milton. The upper section of this portion of the Vermilion River forms part of the common boundary between Lafayette and upper St. Martin parishes, while the lower section forms part of the common boundary between Lafayette and

Vermilion parishes. Much of the development of all three of these parishes was associated with settlement and commerce along their waterways, including the Vermilion River. This discussion reviews the history of the project vicinity, with an emphasis on the evolution of the city of Lafayette and the riverine activities that prompted the economic growth of the region adjoining the banks of the Vermilion.

Colonial Era

During the French and Spanish colonial periods, the project vicinity was included in that part of the Louisiana colony called the Attakapas region, or district, named for one of the Native American tribes indigenous to the area. Overall, the French colonial period was not one of growth. The earliest significant influx of white settlement came during the term of transition from French to Spanish rule. French trappers and concessionaires were joined in the Attakapas region by Acadians, many from the Chignecto Isthmus of Nova Scotia, and Málagans, emigrants from the Costa del Sol in southern Spain. By the end of the Spanish regime, the Vermilion River was lined with land claims.

French Colonial Period

Nearly 140 years following the last of the unsuccessful sixteenth century Spanish expeditions through the Louisiana region, the French began exploration of the lower Mississippi River. On April 9, 1682, Réné Robert Cavelier, Sieur de la Salle, claimed all lands drained by the Mississippi River for Louis XIV, King of France. Sixteen years later, in 1698 - 1699, Pierre le Moyne, Sieur d'Iberville, led an expedition to explore the lower "Colbert or Mississippi River, from its mouth to the Natchez Nation," and to "establish a colony in Louisiana" (French 1875:29, 31).

Shortly after the founding of the Louisiana colony in 1699, the French began to establish permanent settlements along the Mississippi River and the Gulf Coast; however, colonization of southwestern Louisiana was not encouraged by the French government. Additionally, settlers were reluctant to leave the security of the Mississippi River posts for "the west," as the territory was called by the French colonists. Still, Spanish missionaries reported secluded groups of colonists in the Attakapas as early as 1713. The Native Americans of the Attakapas-Opelousas region initiated trade with the colonial government, offering pelts, tallow, and horses in exchange for French goods. By the 1740s, a profitable deerskin and fur trade had been established with the "Attakapas Country," which name had replaced "the west" as the common designation for southwestern Louisiana (Figure 8) (Bergerie 1962:3; DeVille 1973:24-31, 1986:4; Fontenot and Freeland 1976:1; Iberia Parish Development Board ca. 1948:12).

The French government proposed a military post in the Attakapas country as part of its plan to protect and secure the boundaries of the developing Louisiana colony. The *Poste des Opelousas* was established under the command of Louis Pellerin in 1763, shortly before western Louisiana was transferred officially to Spain. The Opelousas Post, situated in the vicinity of modern-day Port Barre (St. Landry Parish), also apparently was referred to as Attakapas, for the region it served; however, that name was discontinued with the establishment of the *Poste des Attakapas* at present-day St. Martinville (Brasseaux 1987:94; DeVille 1973:32-34; Fontenot and Freeland 1976:19; Pittman 1973:36).

Spanish Colonial Period

On November 3, 1762, under terms of the Treaty of Fontainebleau, France secretly ceded the Isle of Orleans and the entire Louisiana colony west of the Mississippi River to Spain. This cession rid France of the heavy financial burden of administering and supporting the colony, but also prevented a sizeable portion of the territory from falling under British control as a result of the impending English victory in the French and Indian War. Although the transfer was announced publicly in 1764, it was not until 1769 that the French colonial government

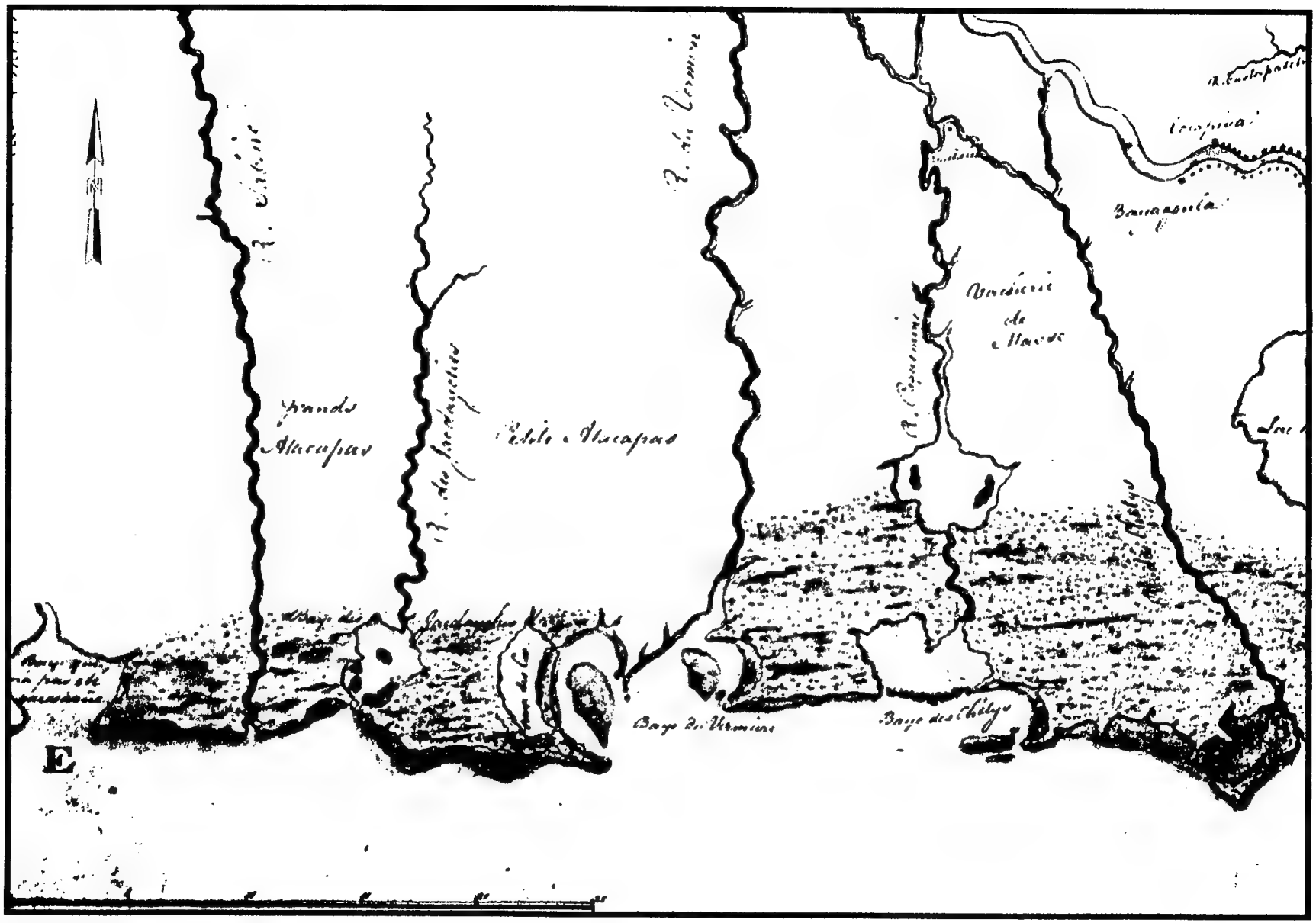

Figure 8. Excerpt from an unidentified surveyor's 1760 map of Louisiana, with reference to the project vicinity. Excerpt depicts the *Atacapas* [Attakapas] region west of the *R. du Vermilion* [Vermilion River]

finally was abolished and Spanish control was established under the governorship of Alejandro O'Reilly (Chambers 1898:48; Davis 1971:69-70, 97-105).

During the transition period from French to Spanish rule, small groups of exiled Acadians arrived in Louisiana and were sent by the French government in New Orleans to the Attakapas region. The Spanish Attakapas District extended "along the sea coast between the Delta of the Mississippi and the Western boundary" (the Sabine River) and was bounded above by the Opelousas District (Sibley 1806:97). Several Acadian settlements were established ca. 1765 - 1766 in these southwestern districts. Closest to the project corridor were *La Manque*, located approximately 3.2 km (2 mi) below present-day Breaux Bridge (along Bayou Teche) in St. Martin Parish, and *Côte Gelée*, which was established on the west bank of Bayou Tortue between the modern communities of Pilette (on the southeastern outskirts of Lafayette) and Broussard in Lafayette Parish (Figure 9). The census of April 25, 1766, listed an estimated 150 inhabitants of the Attakapas District, including 37 (17 households) at *Côte Gelée* and 45 (14 households) at *La Manque*. Although these early Acadian settlements lay 4 - 6.5 km (2.5 - 4 mi) east of the project corridor, their establishment was critical for the development of the region (Brasseaux 1987:93-95; Voorhies 1972:124-125).

In early 1770, Don Eduardo Nugent and Don Juan Kelly journeyed through western Louisiana on a fact-finding expedition for the colonial government. Their report to the Spanish governor recorded a white population of 166 inhabitants in the Attakapas District. Additionally, the account listed 33 slaves, of whom 26 were at least 12 years of age and "able to work." The livestock included 1,323 oxen and bulls, 18 calves, 14 "carts with oxen", 266 horses and mares, and 565 pigs (Martin 1976:187, 191-192). The conclusion of the district survey noted:

> This district is quite similar to the district of Opelousas with regard to pastures and food production [corn, rice, and sweet potatoes]. Considered as a whole, it stretches over twenty leagues of longitude by six of latitude with population scattered throughout the district.
>
> The Attakapas are favored with a better situation. More lands are cleared [there] than in the Opelousas District. The Acadians have settled there and raised cattle. They are extremely industrious and eager to work. Their women weave cotton, which they turn into excellent cloth. They use it to make clothes for everyone. They also make stockings and cloth which they use as linen, but they were discouraged from cultivating cotton and manufacturing it, not knowing if the government would permit them to do so (Martin 1976:192).

By 1774, the general census of the Attakapas region (October 30, 1774) listed 129 white adults and 194 white children, 12 free black adults and 6 free black children. One hundred fifty-five slaves were counted. The white inhabitants owned 5,208 head of cattle, 701 horses and mules, 1,126 pigs, and 96 sheep. The free blacks owned 87 head of cattle, 33 horses and mules, and 45 pigs (Voorhies 1972:280-283).

During the 1770s, many Acadians moved westward from their settlements along Bayou Teche and Bayou Tortue to the Vermilion River. By 1777, approximately 12 families had migrated westward to settle at *Grande Prairie*, located just northwest of modern downtown Lafayette (and the project corridor). During the next year, an additional 18 or so Acadian families settled farther south, between present-day Lafayette and Abbéville; however, settlement beyond the flood plain of the Vermilion River proceeded slowly since timber supplies in those areas were not adequate to sustain a settlement. Low, flood-prone banks initially discouraged migration to the upper Vermilion River as well, but settlers ultimately were attracted by the fertile soil and established homes north of today's Lafayette at *Beaubassin* and *La Grande Prairie de*

Bayou Carencro (Figure 10)(Brasseaux 1987:96). By the mid-1790s, a number of Acadians had settled at *Grande Prairie de Vermilion*, which was the plains region situated west of the Vermilion River between present-day Lafayette and Maurice (Brasseaux 1987:95-99).

Among the Acadians who acquired Spanish land grants along the Vermilion River within the bounds of the project corridor were Olivier Thibedeau [sic], André or Andrew Martin, Joseph Broussard, Joseph Decoux, and Juan Berard. Early claims also were conveyed to members of the Trahan, Dugas, Labbé, LeBlanc, and Breaux families (Figures 11a-11d). The Broussard, Thibedeau, and Dugas families were part of the eight Acadian "Chieftain" families that originally were dispatched to settle the Attakapas region. Downstream from the project corridor, along the lower Vermilion River, many land grants also were held by Americans, Englishmen, and French nationals (Griffin 1959:15-17; Vermilion Historical Society [VHS] 1983:7-9).

Throughout the Spanish era, the Attakapas region grew and prospered. In 1784, the American geographer Thomas Hutchins published the following account of the area:

> Although this country might produce all the valuable articles raised in other parts of the globe, situated in the same latitudes, yet the inhabitants principally cultivate indigo, rice, tobacco, Indian corn and some wheat; and they raise large stocks of black cattle, horses, mules, hogs, sheep and poultry. The sheep is said to be the sweetest mutton in the world. The black cattle, when fat enough for sale, which they commonly are the year round, are driven across the country to New Orleans, where there is always a good market [sic throughout] (Hutchins 1784:48).

This document reflects the economic importance of animal husbandry within the Attakapas region during the late eighteenth century. Most of the Attakapas Acadians immigrated from the Chignecto region of Nova Scotia, "a sparsely wooded sea marsh and prairie that for half a century before the Grand Dérangement had supported small cattle ranches" (Brasseaux 1987:122). A description of the Chignecto beef economy concluded: "In view of their background, it is hardly surprising that the 1765 Acadian immigrants, whose leaders were drawn exclusively from the Chignecto Isthmus, selected homesites in South Louisiana's prime grasslands and immediately engaged in ranching" (Brasseaux 1987:122). Acadian herdsmen drove their cattle to market in New Orleans down a trail that ran parallel to Bayou Teche; today Highway 90 approximates this route. By the 1780s, Acadian ranchers had emerged as the predominant suppliers of beef for the Crescent City slaughterhouses. In addition to raising cattle, the Attakapas Acadians also farmed enough corn, cotton, and vegetables to be self-sufficient (Brasseaux 1987:122-125).

Descriptions of the region during the colonial era indicate that the Vermilion River did not become an important transport and commerce route until after it became U.S. territory in the early nineteenth century. The area colonists would have employed the waterway for their own needs, using shallow-draft dugout canoes for reaching their fishing, trapping, and timbering destinations (Lafayette Parisn Bayou Vermilion District [LPBVD] n.d.). Bayou Teche, with its eastward waterborne connections, was the water route most commonly used for transportation to the Mississippi River and New Orleans. The portage between the Acadian settlements in the Lafayette area and the *La Manque*, or Breaux Bridge, area of the Teche was approximately 6.4 km (4 mi). To the south, the distance between Vermilion Bay and Bayou Teche was that same portage span, allowing the small Spanish gunboats carrying "immense quantities of bullion and specie from Vera Cruz and the coast of Mexico" to evade enemy detection and make "an easy inland navigation . . . to New Orleans" (Dumain 1832:842).

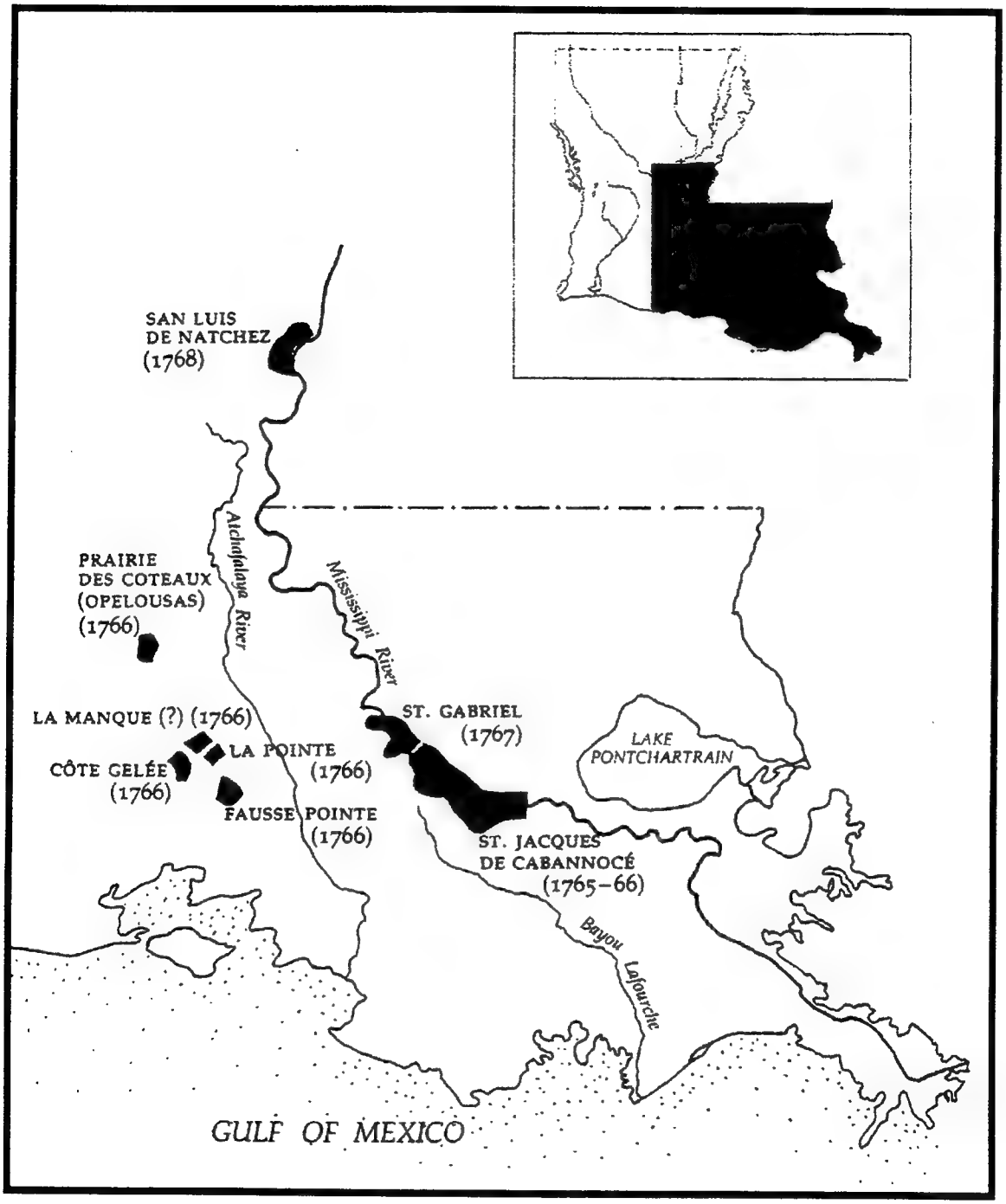

Figure 9. Areas of Acadian settlement in Louisiana, ca. 1760

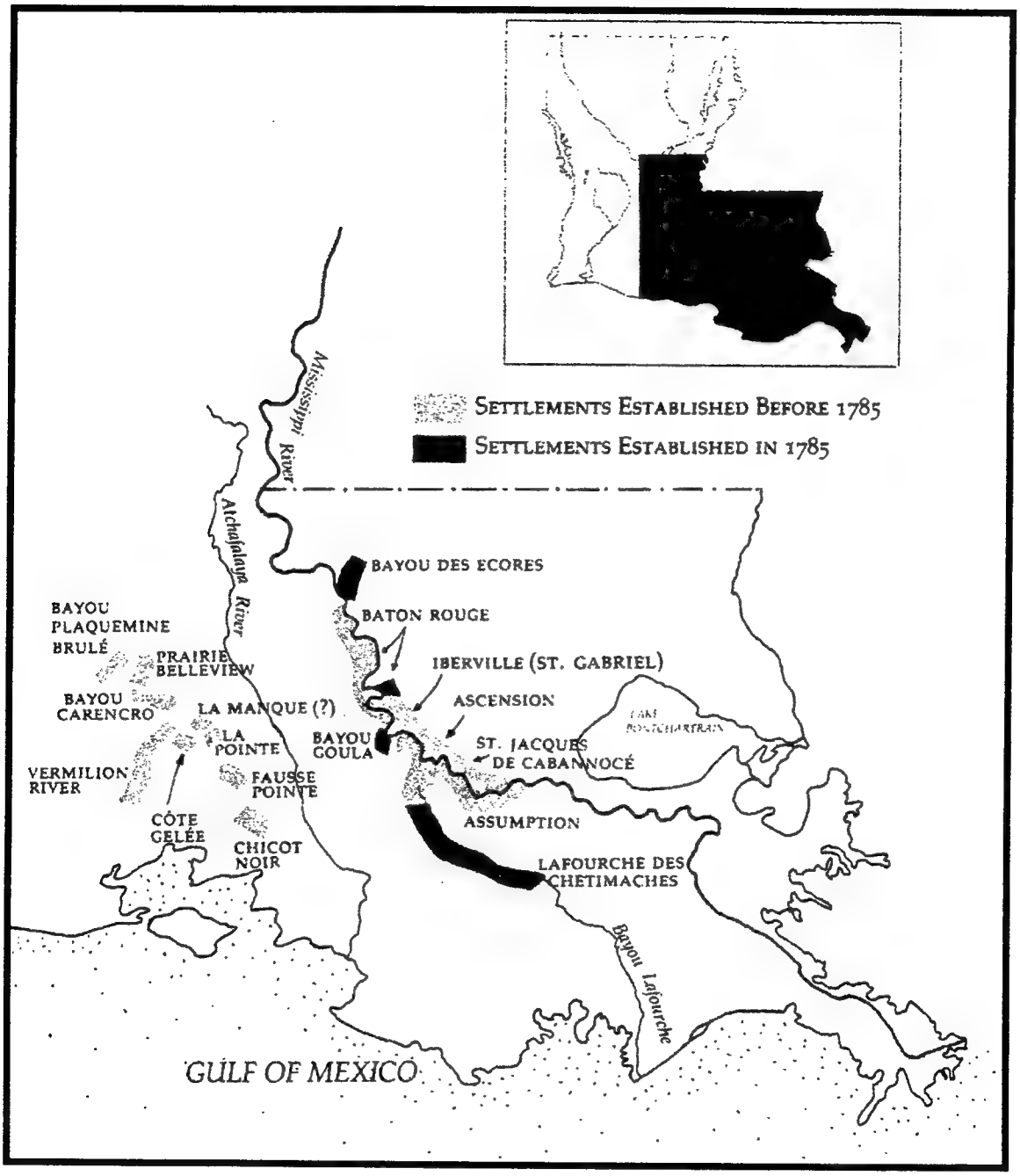

Figure 10. Areas of Acadian settlement in Louisiana, ca. 1780

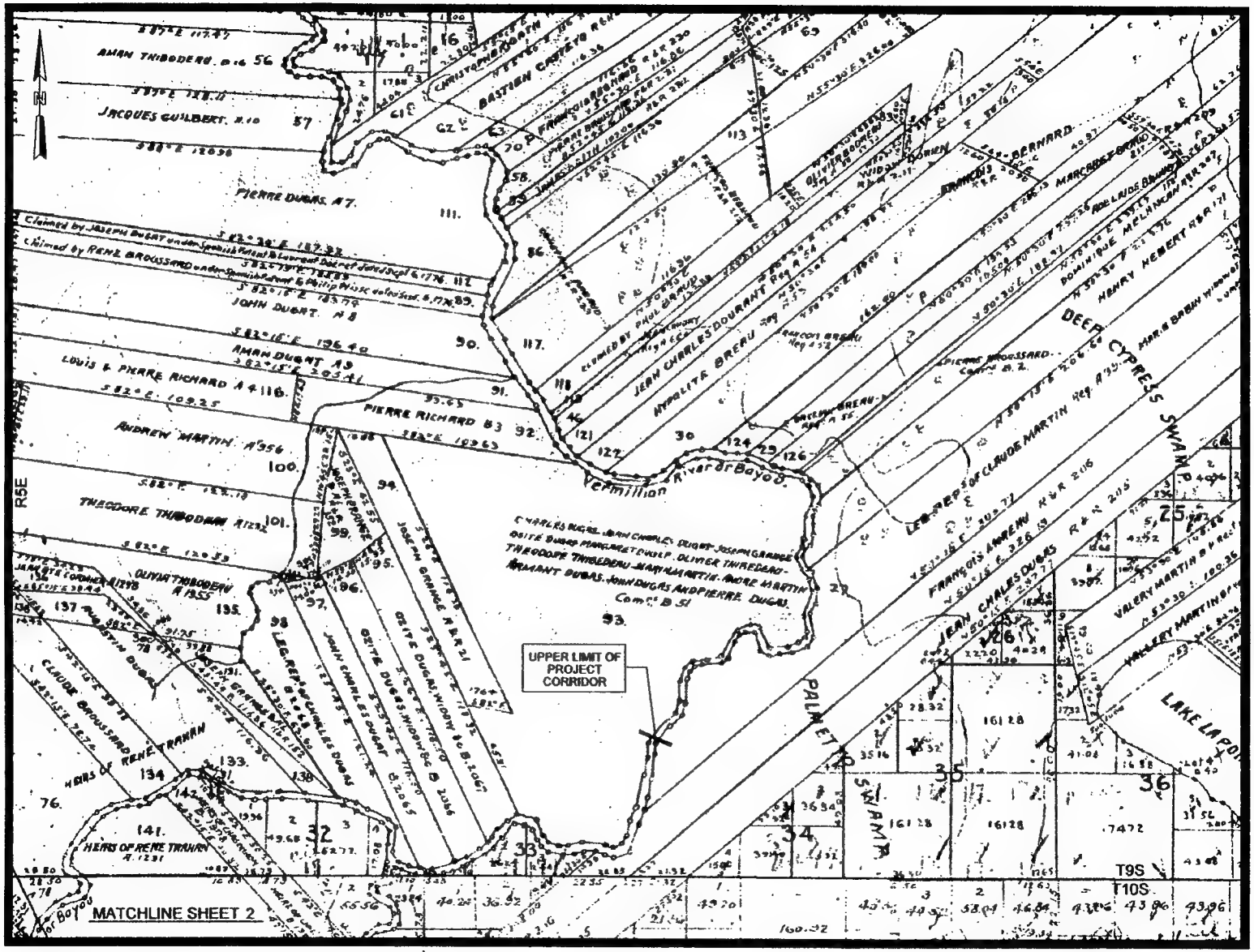

Figure 11a. Excerpts from Sheet 1 of the 1856 Louisiana Surveyor General's original approved plats of Township 9S, Range 5E, and Township 10S, Range 5E, in reference to the project corridor. Excerpts depict early land claims along the Vermilion River or Bayou

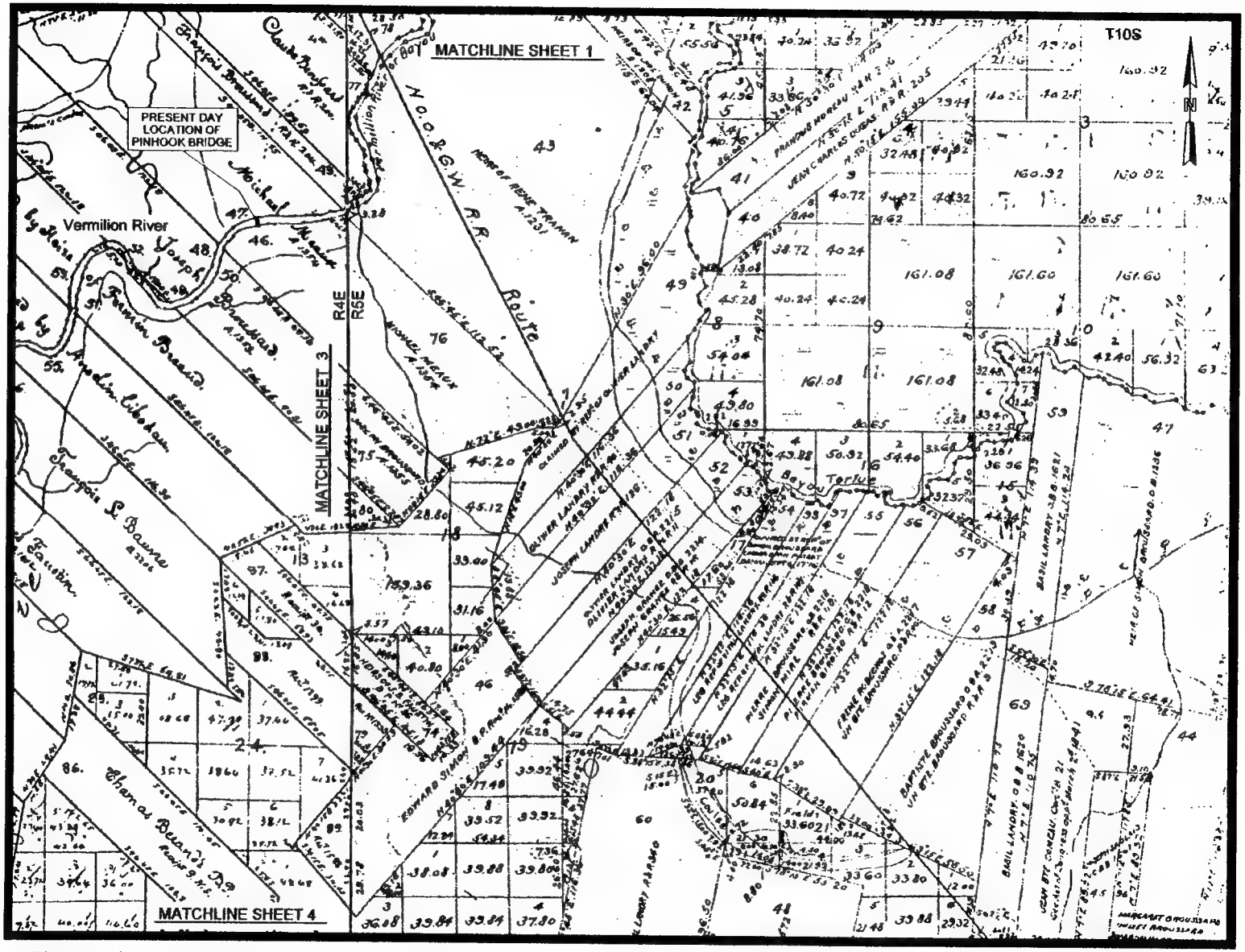

Figure 11b. Excerpts from Sheet 2 of the 1854-1856 Louisiana Surveyor General's original approved plats of Township 10S, Range 4E, and Township 10S, Range 5E, in reference to the project corridor. Excerpts depict early land claims along the Vermilion River or Bayou, as well as trails (indicated by dashed lines) and a proposed rail route through the area. The position of the present-day Pinhook Bridge has been indicated

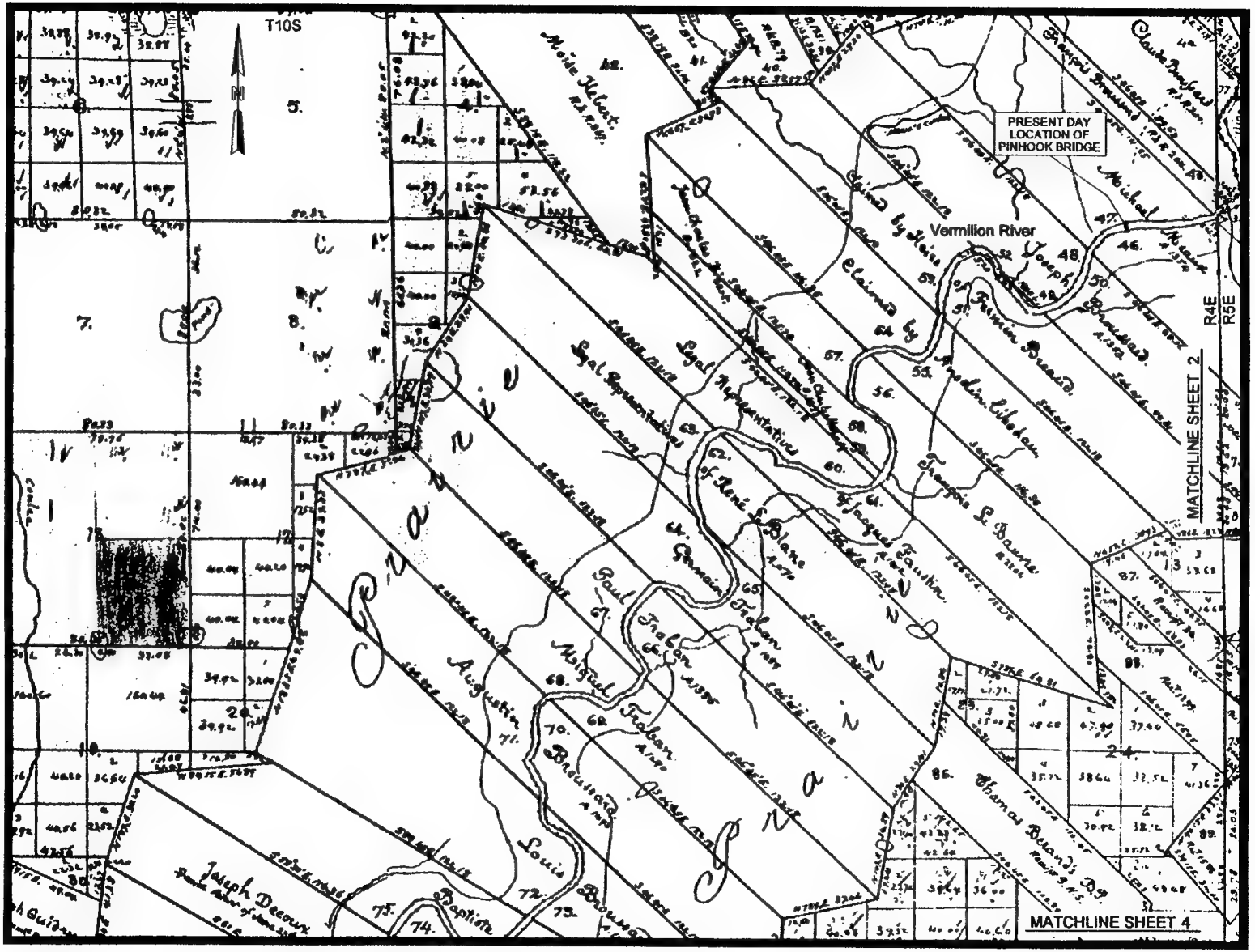

Figure 11c. Excerpts from Sheet 3 of the 1854-1856 Louisiana Surveyor General's original approved plats of Township 10S, Range 4E, and Township 10S, Range 5E, in reference to the project corridor. Excerpts depict early land claims and a trail (indicated by a dashed line) along the Vermilion River. The position of the present-day Pinhook Bridge has been indicated

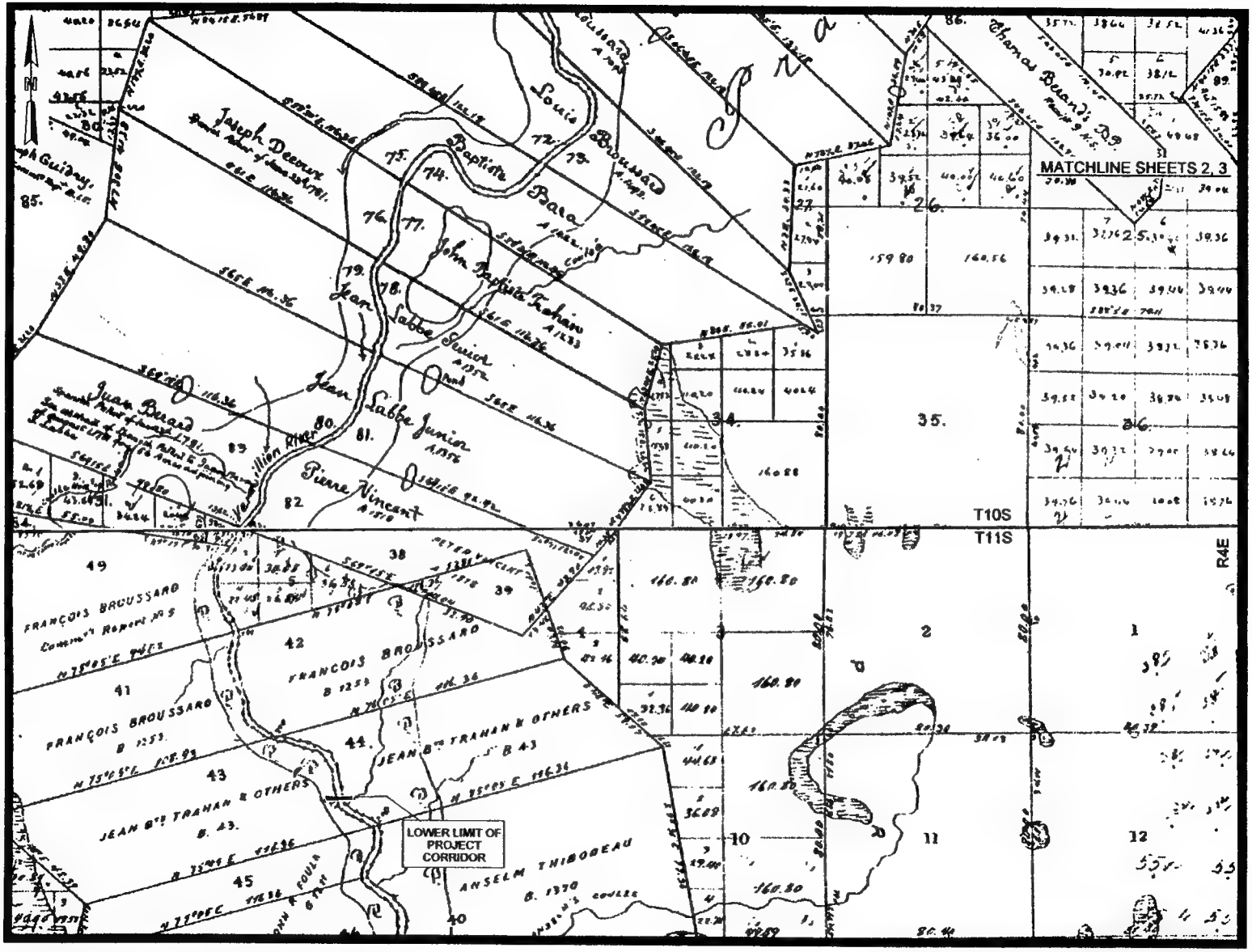

Figure 11d. Excerpts from Sheet 4 of the 1852-1854 Louisiana Surveyor General's original approved plats of Township 10S, Range 4E, and Township 11S, Range 4E, with reference to the project corridor. Excerpts depict early land claims along the Vermilion River

The Vermilion River was known more notoriously as a smugglers' "highway" during the Spanish period. Pinhook Bridge, which today is the Highway 182 (Pinhook Road) crossing of the Vermilion River, was once the site of a small settlement called Petit Manchac, which served as a trading center for Native Americans, trappers, and colonists. During low water periods, Petit Manchac, later called Pinhook, or Pin Hook, was the farthest inland that English smugglers could deliver their goods up the Vermilion River. By the early nineteenth century, this contraband activity had expanded to include the illegal slave trade, as will be discussed later in this chapter (Griffin 1959:27; Hansen 1971:396; LPBVD n.d.).

Territorial and Antebellum Era

As part of the negotiations leading to the 1803 Louisiana Purchase, Spain restored western Louisiana to France, which shortly thereafter conveyed the Louisiana Territory to the United States. On March 26, 1804, that portion of the Louisiana Purchase located below the thirty-third parallel was designated the Territory of Orleans. The following year, Orleans was partitioned into 12 counties, including the county of Attakapas, which encompassed the present-day parishes of Iberia, St. Mary, and Vermilion, most of Lafayette and St. Martin Parishes, and portions of Cameron and Iberville Parishes. In 1807, the territorial legislature reorganized the county system, further dividing the Territory of Orleans into 19 parishes. Attakapas County was superseded by the parish of St. Martin, which encompassed roughly the same territory as its predecessor. On April 30, 1812, the State of Louisiana was admitted to the Union (Figure 12) (Davis 1971:157-164, 167-169, 176; Goins and Caldwell 1995:41-42).

Political boundaries continued to change in the Attakapas region after statehood was declared. Lafayette Parish was carved out of the western half of St. Martin Parish in 1823, and Vermilion Parish was created from the southern portion of Lafayette Parish in 1844. It was not until after the Civil War, in 1868, that St. Martin Parish was redefined (Figure 12). Two years later, Vermilion Parish was established in its present-day configuration, when Cameron Parish was formed from western Vermilion Parish and southernmost Calcasieu Parish (Bergerie 1962:22-23; Goins and Caldwell 1995:44; Griffin 1959:23).

In 1815, the United States government established a construction and repair agenda to address the naval shortcomings exposed during the War of 1812. As part of this program, timber surveys were ordered in 1818 through southern Louisiana and Alabama under the leadership of James Leander Cathcart and James Hutton, with John Landreth as surveyor (Prichard et al. 1945:735-736). According to the journal kept by Cathcart, the original strategy of the expedition included a plan to coast along Vermilion Bay and the Gulf of Mexico as far westward as the Mermentau River (modern Cameron Parish) (Prichard et al. 1945:765). After exploring the mouth of the Atchafalaya River in early February 1819, the venture into the Attakapas country was abandoned due to "the risks of the day, & finding that our boat was not sufficiently large to carry so many men, & provisions along the sea coast, to explore Chenierè au Tigre, & to the Mermentau river" (Prichard et al. 1945:811). It was "unanimously declared, that the boat was not trustworthy," and additionally, the expedition members were warned by their pilot that:

> . . . if we lost our boat, & even got safe ashore, we must inevitably perish, either by the hands of Indian hunters, pirates, or smugglers, which infest this coast, or from wild beasts, the Panther or Tiger, being numerous, that we could not cross the innumerable swamps & Bayous which intersect this Country, & would die of hunger, before we could get to any habitation, even if we escaped the other dangers . . . (Prichard et al. 1945:811).

Upon reviewing these "disagreeable circumstances," it was determined that an inland survey of the timberlands between the Vermilion and Mermentau Rivers, via Bayou

Teche and St. Martinville, would be a wiser course of action; however, that plan also was abandoned after the expedition arrived in St. Martinville and reviewed the anticipated dangers, logistic difficulties, and expenses of an overland journey. These vivid journal entries of 1819 suggest that much of the Attakapas region remained uninhabited at that time, not to mention inhospitable. However, some historians hypothesize that the reports of the perils lurking in southwestern Louisiana may have been exaggerated to discourage Federal representatives from scrutinizing certain lawless activities too closely (Prichard et al. 1945:811, 817-827, 898-902).

Among the Americans who held land tracts along the lower Vermilion River was Reason (also spelled Resin or Rezin) Bowie, patriarch of the famed family linked to the Louisiana slave trade, the Bowie knife, and the Alamo. Bowie brought his family to Louisiana ca. 1801 – 1802, and settled first in Catahoula Parish before moving to the Attakapas region. In 1809, Bowie purchased his Vermilion River property (known as Bowie's Woods, located between the river mouth and its conjunction with Little Bayou) from John Grecian, who apparently acquired the tract under Spanish colonial rule. Grecian "had been in the practice of getting timber on the land for boat building for fifteen or twenty years past" (VHS 1983:8). Research did not indicate whether or not Bowie continued Grecian's land use activities on his Vermilion acreage; however, Bowie family members did engage in the lumber and sawmill business when they later moved to the Opelousas region of St. Landry Parish (Bradshaw 1997; VHS 1983:8; Williamson 1999a, 1999b).

According to John J. Bowie, son of Reason and brother of Rezin P. and Jim Bowie, the Bowie brothers were associated with pirate Jean Lafitte through his slave smuggling activities. In an 1852 account, John Bowie described the process as follows:

> James, Rezin and myself fitted out some small boats at the mouth of the Calcasieu and went into the trade on shares. We first purchased forty negroes from Laffite at the rate of one dollar per pound, or an average of $140 for each negro; we brought them into the limits of the United States, delivered them to a custom house officer, and became the informers ourselves; the law gave the informer half of the [auction] value of the negroes, which we put up and sold by the United States Marshall, and we became the purchasers of the negroes, which entitled us to sell them [legally] within the United States. We continued to follow this business until we made $65,000, when we quit and soon spent all our earnings [sic throughout] (Williamson 1999b).

One of Lafitte's delivery routes was through Vermilion Bay to Bowie Island, located near the mouth of the Vermilion River. From that point, the Bowies would transport the slaves up the Vermilion River, then overland to St. Landry Parish, where they were sold (Taylor n.d.; Williamson 1999a, 1999b).

Although the contraband trade tarnished the Attakapas name, as so vividly recounted by Cathcart and Bowie, other descriptions were kinder to this southwestern district. Describing the region to Americans unfamiliar with Louisiana, William Darby wrote: "Nature has been more than usually beneficent to the Attacapas [sic], the fertility of the land is excessive, and the facility of navigation is seldom exceeded. It demands comparatively but little from the hand of art, to complete the benefits of this favored spot" (Darby 1816:73).

Settlement within the Attakapas region proceeded rapidly. Since lands were not difficult to clear, farms could be transformed easily into plantations, and cotton farming soon gave way to sugar cane cultivation. In addition, the region abounded with valuable timber and other natural resources. Inexpensive land encouraged settlement; for example, one arpent of land sold for approximately $4.00 to $5.00 (Sitterson 1953:16). Furthermore, the soil was rich, and inland waterways such as the Vermilion River provided convenient means of transportation.

Figure 12. Divisions of the original Attakapas County, or St. Martin Parish, 1805 - 1868. Derived from St. Martin Parish Development Board (ca. 1950:8)

When it created Lafayette Parish in 1823, the legislature also established a commission to select a seat of justice. The commission initially chose Pinhook, the former Petit Manchac trading post, which stood at the head of navigation of the Vermilion River, where several years earlier, the Lafayette post office also had been established at the Vermilion Bridge (later called the Pinhook Bridge) (Figure 13). The origin of the name "Pinhook" has been much debated. Professor William A. Read suggests that the name was derived from *pinashuk*, the Choctaw name for linden or basswood tree. According to persistent local legend, however, the name originated from an entrepreneur who used to steal chickens by catching them with a device similar to a fishing pole. A grain of corn on a pinhook served as bait, and when the chicken swallowed the bait, the ingenious chicken thief reeled in his prey (Griffin 1959:27-28, 115). According to a third explanation, the bridge at the village site was called Pinhook because it opened and closed like a pin to permit river traffic (Edmonds 1979:82).

The Louisiana Surveyor General's approved plat of Township 10S, Range 4E, indicates that a road or trail once crossed through the Michael Meaux land claim in Section 47 toward the Vermilion River. A river crossing was not marked on the map; however, the point where this pathway, if extended, would have reached the river lies near the position of the present-day Pinhook Bridge (Figure 11d). Although the plat was not approved until November 1854, the original surveys were conducted between 1807 and 1842, with most of the private claims surveyed prior to 1825. These early surveys would have covered the time period when the Pinhook community was evolving from the Petit Manchac trading post landing on the Vermilion River (Louisiana Surveyor General 1854). An early nineteenth century map depicted a river crossing and road network centered around a point on the Vermilion River marked Coleman that coincides with the general location of the Pinhook community and bridge. Judging by other vicinity labels, Coleman probably was a landholder or business owner who had property interests in that area (Figure 14).

When the commission of 1823 selected the Pinhook Bridge site as the seat of the Lafayette Parish government, John and William Reeves donated four arpents of land where the public buildings were to be erected. A jail was built, but the parish used a rented room near the bridge as a courthouse. In the meantime, Jean Mouton formed a local faction to rival the Reeves. Mouton had donated land for a Catholic church approximately 4.8 km (3 mi) from the river; he proceeded to lay out a town around the church, offered to donate to the parish sites for public buildings, and lobbied the legislature to move the seat of justice to his land. In an 1824 election, parish voters chose the Mouton site, called Vermilionville; the choice was confirmed as the parish seat by a district court in 1827 (Figure 15). Vermilionville was incorporated in 1836 and, after the Civil War, it was re dubbed Lafayette. Although the town grew up around the church rather than the bridge, the sprawling city of Lafayette today encompasses the site of Jean Mouton's church (now St. John's Cathedral), as well as the location of the Pinhook Bridge (Griffin 1959:29-34).

Cattle raising continued to prosper on the prairies of southwestern Louisiana through the first quarter of the nineteenth century. By 1827, cattlemen had registered more than 40 brands and identifying marks for livestock grazing in Lafayette Parish alone. Nevertheless, after 1830, ranching declined in relative economic importance, and the prairie grasslands along the Vermilion River were plowed up and replaced with cotton and sugar cane fields. These crops often were cultivated by slave labor but on a comparatively small scale. The farmers of the southwestern prairies maintained only modest operations in comparison to those of the large sugar planters on the Mississippi River and the cotton planters on the Red River (Menn 1964:259-260 passim). Cotton and sugar cane predominated in southwestern Louisiana during the antebellum period; the popularity of rice as a staple crop developed after the Civil War (Griffin 1959:105).

Snags made navigation difficult on the entire route of the Vermilion River, thus hampering the economic growth of the vicinity. Pirogues could travel the shallow bayous of the region, but larger vessels were restricted to navigable waterways. Early traders built their "stores" on barges that carried gunpowder, traps, tea, and other goods to the scattered settlers, who offered furs, hides, and farm products in exchange. Barges also carried passengers traveling long distances; however, barge travel generally was an expensive journey, restricted to the wealthy. Due to navigation limitations, barge service could be obtained at only a few area locations: the Pinhook Bridge at Vermilionville, Breaux Bridge and New Iberia on Bayou Teche, and Washington on Bayou Courtableau (Figure 15) (Chief of Engineers [COE] 1887:2:1401; Griffin 1959:85-86).

Steamboats eventually plied the waters, but submerged logs and stumps continued to present constant obstacles. Between 1840 and 1850, the police jury of Lafayette Parish appropriated $4,000.00, a large sum in those days, to remove obstructions in the Vermilion. These efforts improved navigation, at least temporarily. According to a local newspaper editor, who may have exaggerated, four or five steamboats engaged in regular trade at the Vermilion River's upper landing, the Pinhook Bridge, before obstructions once more clogged the river. Whatever the case, periodic low water presented severe problems for the inhabitants of the region, often rendering the Vermilion route inaccessible. During these low water periods, the only shipping points available to area residents were Breaux Bridge, New Iberia, and Washington, which meant an overland trek to Bayou Teche or Bayou Courtableau (Figure 15) (Griffin 1959:87).

According to ship enrollment records, most of the registered vessels based in the Attakapas region were schooners or sloops that sailed primarily along Bayou Teche. Most references to the port of Attakapas meant the town of Franklin (located along the Teche in present-day St. Mary Parish), which was the port of entry for the region during the early nineteenth century. The port of Lafayette usually referred to the town of Lafayette, in present-day uptown New Orleans, that later was incorporated into the municipal limits of New Orleans, rather than the parish of Lafayette (Figure 16) (Survey of Federal Archives in Louisiana [SFAL] 1941-1942).

Of the few Lafayette Parish shipowners, the one mentioned most often was Robert Perry of Vermilionville. During the 1820s, Perry constructed the first bridge across the lower Vermilion River (in present-day Vermilion Parish). The community that developed around the crossing became known as Perry's Bridge, or Perry Village, and served as the Vermilion Parish seat for a decade until Abbéville, located approximately 4.8 km [3 mi] upriver, was designated the permanent seat of government in 1854 (Figures 15 and 16). Since that time, the town name has been abbreviated to Perry (Vermilion Parish Development Board [VPDB] ca. 1965:8; Vermilion Parish Tourist Commission [VPTC] 1999).

During the 1830s and 1840s, Robert Perry owned at least four schooners – the *Augustus*, the *Kosciusko*, the *Lady of the Lake*, and the *Southerner* – all of which were registered or enrolled at the port of Attakapas, or Franklin, at some point in time (Table 1). The *Lady of the Lake*, built at Madisonville on Lake Pontchartrain in 1820, originally was based out of New Orleans, but in 1828, the schooner was purchased by Fayette [sic] Parish resident François Marceau. In 1833, Perry bought the *Lady of the Lake* and also served as the ship's master. Research did not confirm whether the Lafayette port where Captain Perry based this schooner was near his Vermilionville home or was the city of Lafayette near New Orleans, where Perry first registered the *Kosciusko*. In any case, Perry's vessels all probably traveled the Bayou Teche route to New Orleans and may have sailed along the Vermilion River, as well. His schooner *Augustus* was one of the few registered vessels built in Vermilion Parish (1832); however, it was enrolled and based at Franklin (SFAL 1942:2:89; 3:15, 116, 118, 199-200; 4:154).

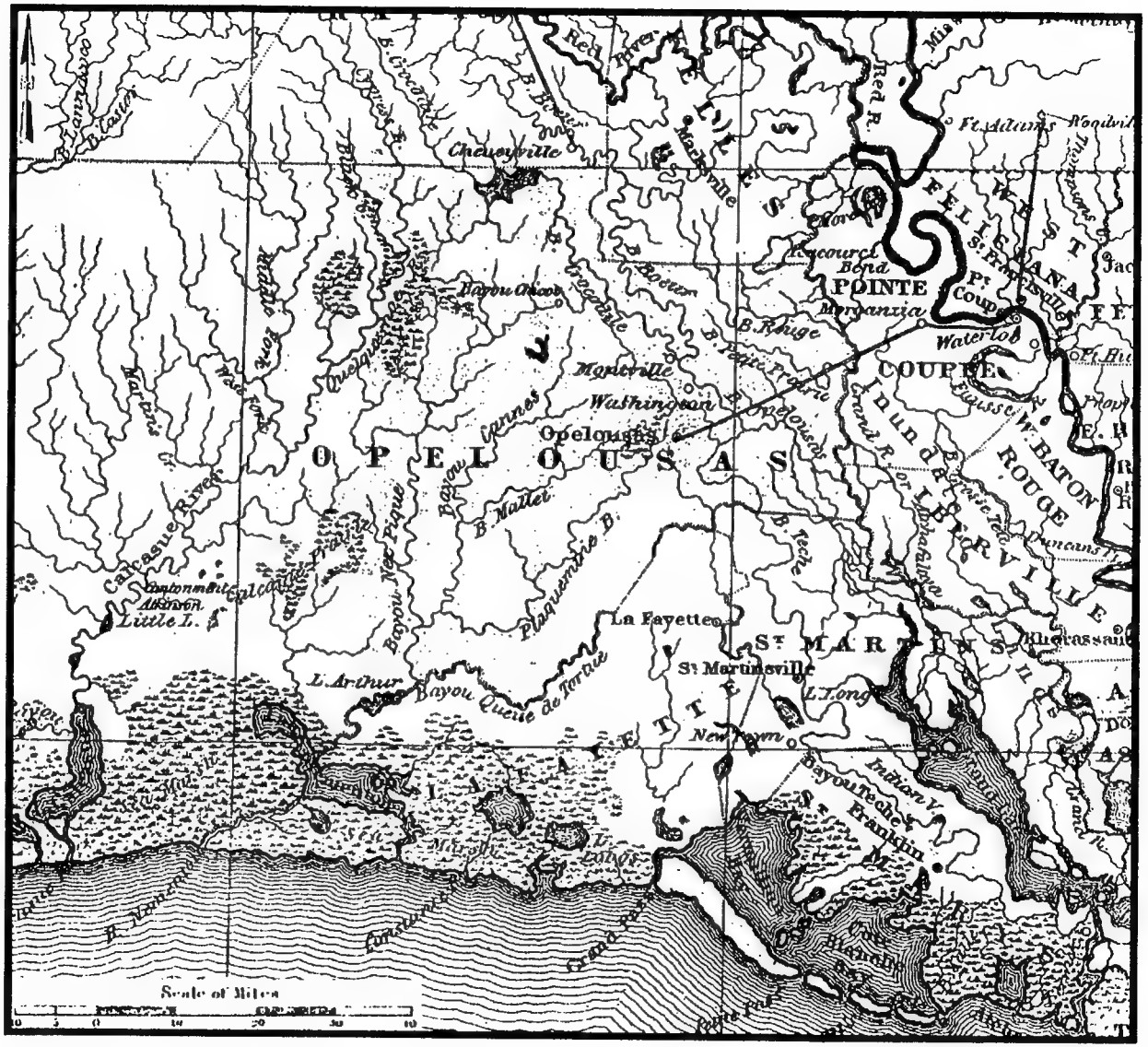

Figure 13. Excerpt from Boynton's 1838 *Louisiana* with reference to the project vicinity. Excerpt depicts the region surrounding the La Fayette [sic] post office

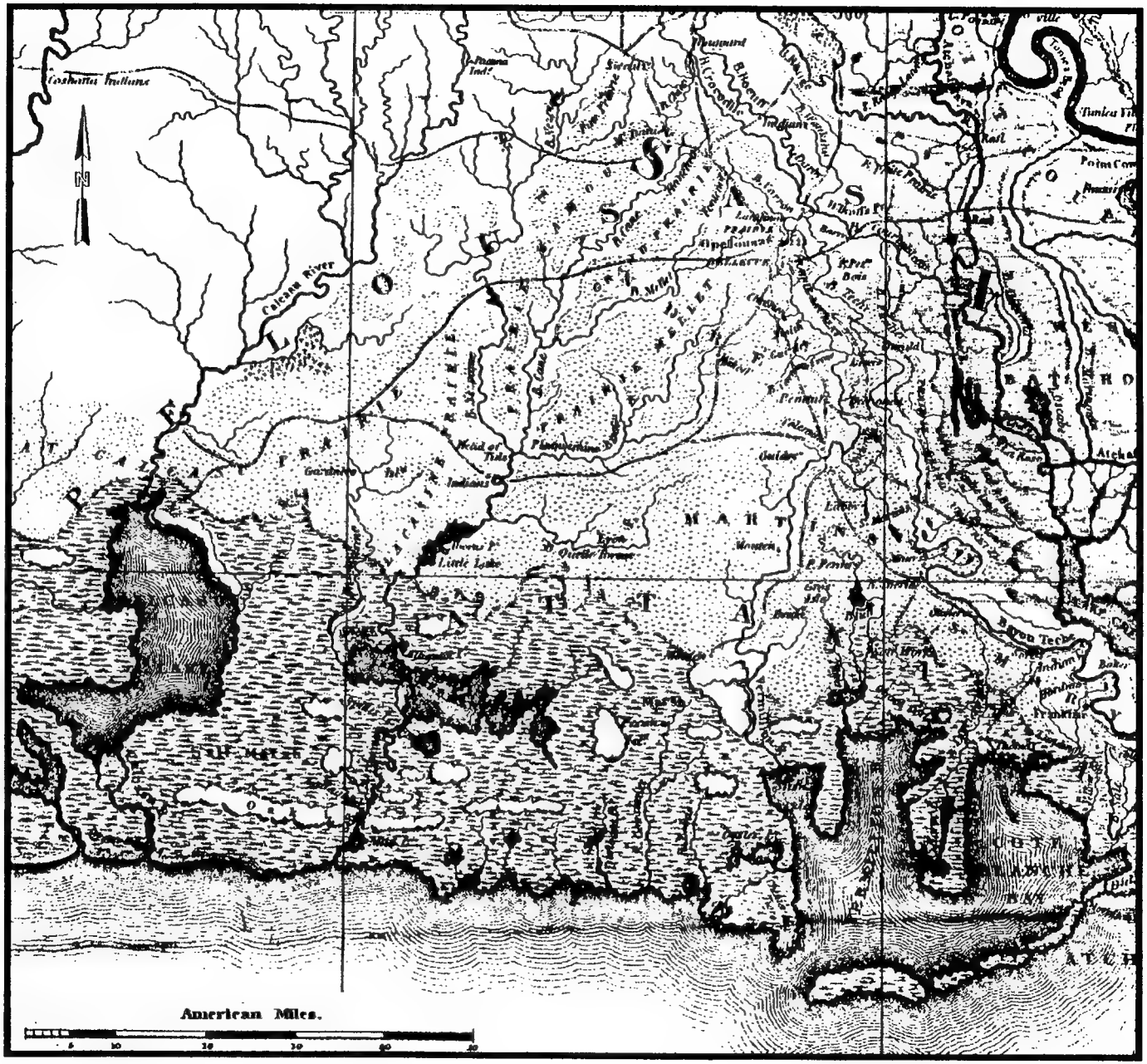

Figure 14. Excerpt from Tanner's 1820 *Louisiana and Mississippi*, with reference to the project vicinity. Excerpt depicts river crossings and roads along the Vermilion River

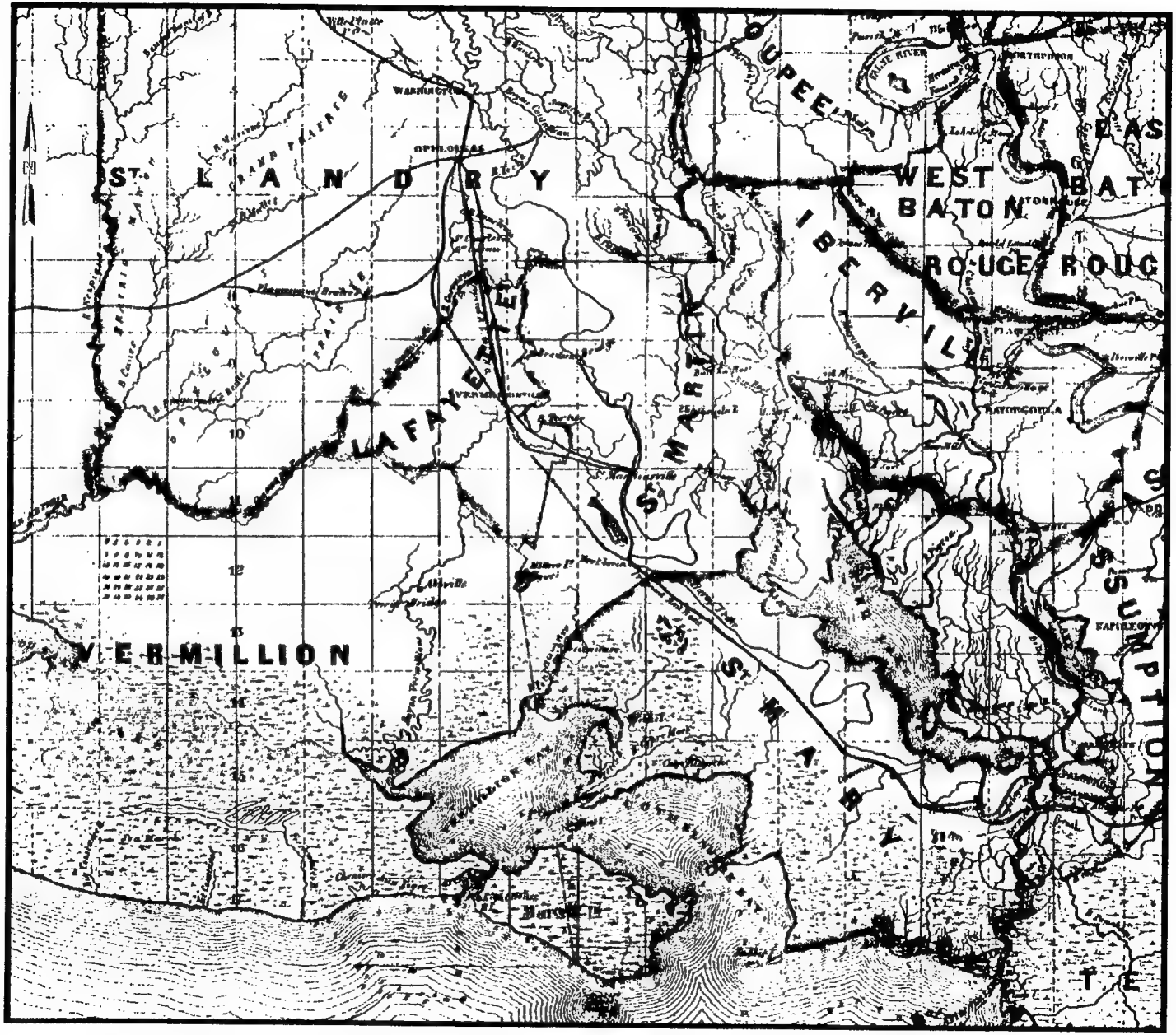

Figure 15. Excerpt from Bayley's 1853 *New and Improved Map of Louisiana*. Excerpt depicts the region surrounding Vermilionville

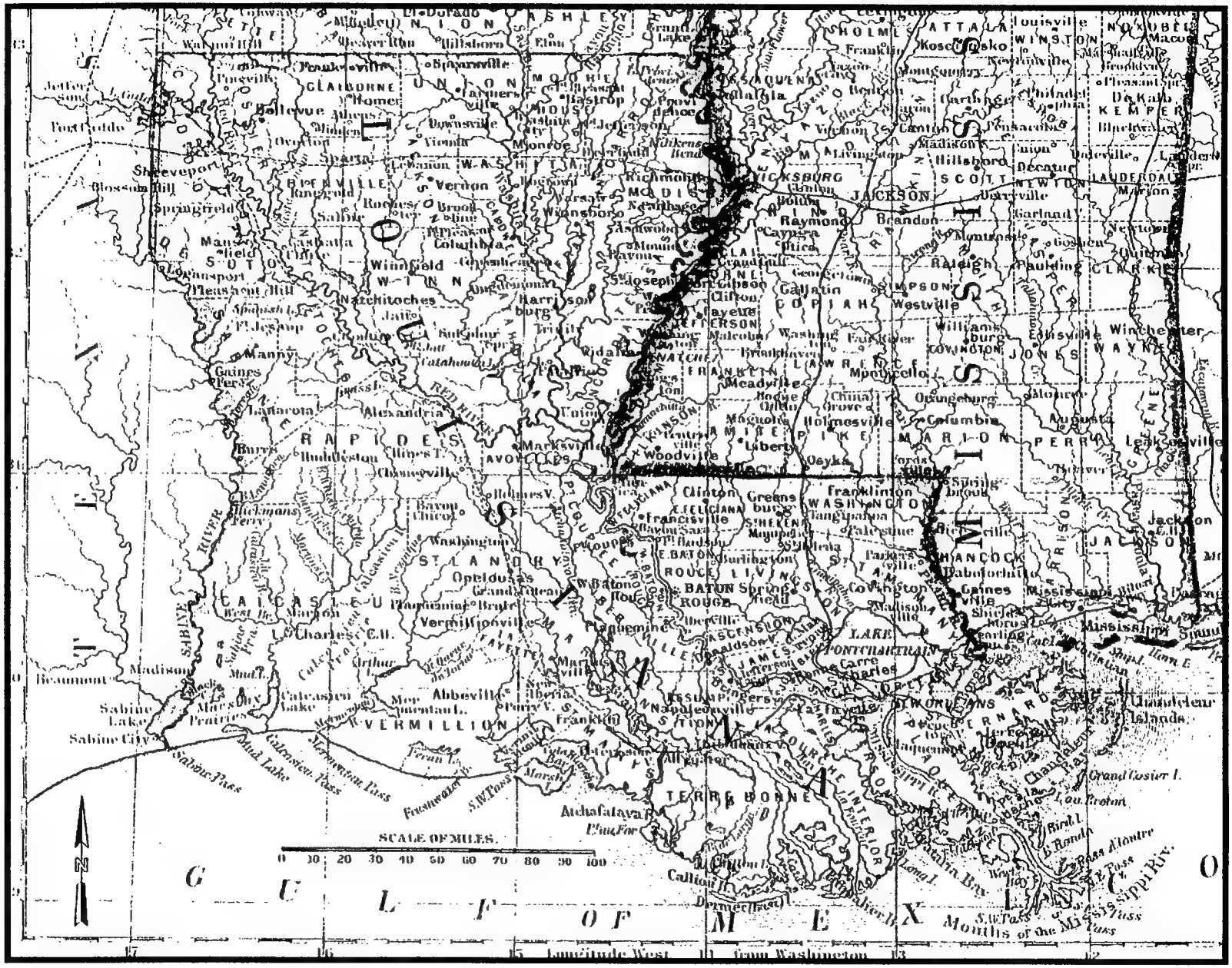

Figure 16. Excerpt from Mitchell's 1860 *County Map of Louisiana, Mississippi, and Arkansas*. Excerpt depicts the Vermilionville-Abbeville region; the city of La Fayette [sic] located west of New Orleans; the proposed rail route through Vermilionville, and other features of southern Louisiana

Table 1. Antebellum vessels owned by Robert Perry that were registered at some point at the Port of Attakapas, or present-day Franklin (Survey of Federal Archives in Louisiana [SFAL] 1941-1942)

Vessel Name	Vessel Type	Date Built	Place Built	Description	First Registered by Perry	Home Port(S)	Source
Augustus	Schooner	1832	Vermilion Parish, LA	55 81/95 tons; 56'5" x 18'10" x 6'3"; 1 deck, 2 masts, square stern, plain head	1833	Franklin	SFAL 1942:3:15
Kosciusko	Schooner	1835	New Haven, CT	30 44/95 tons; 47'7" x 15"4" x 4'11"; 1 deck, 2 masts, square stern, billethead, round tuck	1838	Lafayette and Franklin	SFAL 1942:3:116, 4:154
Lady of the Lake	Schooner	1820	Madisonville, LA (Lake Pontchartrain)	16 27/95 tons; 37'5" x 11'7" x 4'5"; 1 deck, 2 masts, round stern, fiddlehead	1833	Lafayette	SFAL 1942:2:89, 3:118
Southerner	Schooner	1836	Hancock Co, MS	48 26/95 tons; 59'10" x 19'9" x 4'10"; 1 deck, 2 masts, square stern, bust head	1837	Balize	SFAL 1942:3:199-200

Although steamboats had journeyed along Bayou Teche since 1820, it appears that relatively few steamers traveled the Vermilion River route before the Civil War. In fact, of the known steamboats registered out of the port of New Orleans during the antebellum years, there apparently was only one based at a Vermilion port. The *Arthur*, owned and captained by area resident François Corso, was built at Vermilion, or Abbéville, in 1852. This vessel was described as a 230-ton wood-hulled sidewheel packet measuring 133 ft x 29 ft x 6.5 ft, with one deck, one mast, and a square stern. The brief career of the *Arthur* ended when it was "lost" in 1853; however, the researched sources did not reveal the nature or location of that loss (Clune and Wheeler 1991; Lytle 1951:12; SFAL 1942:5:21; Way 1994:31).

During the antebellum era, at least two steamboat wrecks occurred along the project corridor. On March 29, 1842, the *Georgia*, a Pittsburgh-built (1837) 135-ton sidewheeler, burned on the upper Vermilion River between Vermilionville and Bayou Tortue. Several years later, on June 17, 1851, the *Gretna*, a 22-ton wood-hulled sidewheel ferry (built in Gretna, Louisiana, in 1847), exploded a short distance below the site of the *Georgia* mishap, apparently near the Pinhook Bridge. While no lives were lost in the earlier incident, the explosion of the *Gretna* cost three lives (Clune and Wheeler 1991; Lytle 1951:75, 79, 220, 231; Way 1994:200).

Along with limited steamer commerce along the Vermilion River, the lack of rail transportation also hindered the development of the region during the antebellum period. In 1850, the New Orleans, Opelousas, and Great

Western Railroad completed its tracks from the New Orleans to Brashear City (present-day Morgan City). Plans called for the railway to continue through New Iberia to Vermilionville and northward into St. Landry Parish; however, completion of the line was not effected until well after the Civil War (Figure 11b, Figure 15, Figure 16) (Griffin 1959:87-88).

The Project Corridor on the Eve of the Civil War

The plantation system (consisting of staple crop production by a controlled labor supply) had developed along the project corridor by the eve of the Civil War. A few hundred yards below the Pinhook Bridge, on a high bank overlooking the Vermilion River (on its right descending side), was Walnut Grove Plantation. Jean Sosthene Mouton acquired this establishment when he married his cousin, Charlotte Mouton. Her father, Governor Alexandre Mouton (1843-1846), presented the property to the couple as a wedding gift. Reminiscences of the plantation and its environs were provided in the unpublished memoirs of the couple's son, Alexander Mouton. These memoirs were utilized extensively in the history of Lafayette Parish written by Alexander Mouton's son-in-law, Harry Lewis Griffin. Walnut Grove Plantation fronted the west bank of the Vermilion River and included most of today's Bendel Gardens Subdivision (Calhoun 1995:472; Griffin 1959:39).

In 1860, on the eve of the Civil War, Sosthene Mouton owned 56 slaves. He produced cotton rather than sugar cane on his 900 ac (364 ha), 720 ac (291 ha) of which were improved. Mouton owned 20 horses, 20 mules, 26 sheep (yielding 60 pounds of wool), 25 swine, 25 milk cows, 15 working oxen, and other cattle numbering 20. In 1860, his plantation produced 180 bales of cotton, each bale weighing 400 pounds. In addition, Mouton produced 3,000 bushels of Indian corn and 180 bushels of sweet potatoes during that same year (Menn 1964:260-261). Unfortunately, the plantation house at Walnut Grove was burned by Federal troops during the Civil War (Griffin 1959:145).

Directly across the Vermilion River from Walnut Grove, and also fronting on the project corridor, stood Izidor Broussard's plantation. Like Mouton, Broussard also cultivated cotton utilizing slave labor. In addition, animal husbandry provided an important source of his income, specifically cattle, horses, and sheep. About 5 km (3 mi) below the Broussard acreage was the plantation belonging to Honoré Beraud, who also kept a sawmill. Beraud died of yellow fever in the epidemic of 1858; however, his plantation home, known as Long Plantation, survived well into the twentieth century. Upstream from Beraud and Broussard was the John Republican Creighton plantation (later called Myrtle Plantation), which was located above the Pinhook Bridge along the east bank of Vermilion Bayou, as the river was called above the bridge, and just southwest of the present-day Lafayette Regional Airport. Creighton was married to Euphemie Mouton, niece of Governor Mouton. In addition to his cotton interests, Creighton also ran a sawmill near Vermilion Bayou, and attached to this sawmill was a gristmill where biweekly he ground his neighbors' corn into meal and grits (Barde 1981:273; Griffin 1959:39-41, 57 facing, 122).

Above the Creighton plantation was the eastern portion of Governor (and former U.S. Senator [1837-1842]) Alexandre Mouton's vast Ile Copal ("Sweet Gum Grove") Plantation, which extended across both sides of Vermilion Bayou. Eastward from the bayou toward Lake Martin (St. Martin Parish) was a swampy region that Mouton exploited for its timber. Logs were cut in the swamps and then floated downstream to the Creighton sawmill where they were processed into lumber. The principal part of Ile Copal Plantation, including the mansion, brick sugar mill, and slave quarters, lay on the west bank of Bayou Vermilion. According to the 1860 federal census, Mouton's real estate consisted of 2,100 improved ac (850 ha) and 18,140 unimproved ac (7,341 ha), valued at $81,000.00. His personal property was valued at $120,000.00; this amount would have included the worth of his 120 slaves. Unlike his neighbors, Mouton cultivated sugar cane

rather than cotton. In 1860, he harvested 180 hogsheads (1,000 lbs each) of cane sugar, 12,000 gallons of molasses, 4,000 bushels of Indian corn, 60 bushels of peas and beans, 30 bushels of Irish potatoes, and 900 bushels of sweet potatoes. His livestock included 20 horses, 50 mules, 12 milk cows, 16 working oxen, 70 sheep (yielding 140 pounds of wool), and 15 swine. Mouton assigned garden plots to his slaves, who also were permitted to raise chickens and gather Spanish moss for sale in Vermilionville (Calhoun 1995:476; Griffin 1959:40-43; Menn 1964:260-261).

Downstream from Governor Mouton's Ile Copal Plantation stood the Pinhook Bridge, a low wooden structure with a draw that could be opened to allow boats to pass. Jim Higginbotham's enterprises stood on the right descending bank of the Vermilion River by the road to the bridge (between Walnut Grove and the highway). Higginbotham established his home there, as well as a large warehouse with storage space that was utilized by steamboats and shippers. Near the warehouse was his wheelwright shop, where Higginbotham made hickory chairs with rawhide seats, spinning wheels, and other household items. He also operated a lumberyard adjoining the warehouse. Higginbotham's neighbor, John Baumgartner, who also was a woodworker, assembled cypress cisterns, hogsheads, and molasses barrels in a shop next to his home (Griffin 1959:40-41).

When a traveler crossed the Pinhook Bridge to the right descending bank of the Vermilion River, he found the Higginbotham enterprises on the left side of the road. On the right side of the road at the bridge stood William Butcher's saloon and billiard parlor, a popular place of recreation and refreshment during the antebellum period. Nearby was the restaurant operated by Louis Grangé, famed for its chicken pies. The local inn, which ceased accommodating travelers and became a private residence ca. 1853, was located farther along the west side of the road toward Vermilionville; this property is of interest because it was occupied by Union troops during Civil War skirmishes along the Vermilion River (Café Vermilionville n.d.; Griffin 1959:40-41, 48; Louisiana National Register of Historic Places [LNRHP] ca. 1983). Sources vary on the construction date of the Vermilion Inn, as the structure is commonly referenced today, i.e., "long before the Civil War" (Griffin 1959:48), "prior to 1818" (Café Vermilionville n.d.), and ca. 1835 (LNRHP ca. 1983). Today, the Vermilion Inn has been renovated and, as Café Vermilionville, once again serves the public.

The establishment of these businesses at the Pinhook Bridge indicates the importance of that river landing to the development of the region. Although the town of Vermilionville existed a few miles away from the Vermilion River, waterborne travel and commerce, by necessity, had to be conducted from the Pinhook location. The establishments that existed near the bridge both accommodated trade and served the traveler. The road leading from the Pinhook Bridge also was a main entrance into Vermilionville, the only substantial town located near this stretch of the upper Vermilion River.

As noted previously, there once was a ferry in the general location of the Pinhook Bridge. Research disclosed only one other antebellum ferry along the project corridor, located downriver in the vicinity of the Broussard Cemetery (Vermilion Parish), and above the present-day town of Milton (Lafayette Parish). This latter ferry apparently was a private conveyance used by the Broussard family and their neighbors (Barde 1981:91, 282). According to a contemporary description, the ferry in the late 1850s "was secured by a strong iron chain to one of the century-old cypress trees," and it was operated by means of an iron chain, or cable "which extended from one shore to the other" (Barde 1981:91). The Broussard family apparently had held property in this area (Sections 41, 42, and 49, Township 11S, Range 4E) since arriving as Acadian exiles (Figure 11d). On the west bank of the river, on a hill or bluff behind the ferry landing and near a house, was "a modest store containing, on the shelves, a wild assortment of things which the English would call miscellaneous but which the French call hodge-podge" (Barde 1981:92).

One of the Broussard neighbors was an Italian fisherman, Pierre-Marie, who kept his schooner, the *Elma*, on "the southwest branch of the bayou, which formed half of the belt around . . . [the] island" shaped by the bayou and bluff (Barde 1981:92). Pierre-Marie and his crew (at least two of whom also were Italian) sailed the *Elma* down the Vermilion to catch "carps, swordfish, sturgeon, and sea fish" in the bay and Gulf waters beyond the mouth of the river (Barde 1981:93). One source states that the *Elma* was "a single-deck, square stern schooner with two masts and a billet-head measuring 65 x 18 x 5" (Edmonds and Gibson in Barde 1981:282); however, a review of ship registration records indicates that the vessel described actually was a New Orleans-based, New Orleans-owned (1846 - post 1861) schooner built in 1846 (SFAL 1942:4:88, 5:80, 6:82). In any case, the presence of this fishermen's community, along with the ferry and store, indicates that this northeastern corner of Vermilion Parish was an important, if isolated, settlement that may have marked the beginnings of the communities of Maurice, west of the river in Vermilion Parish, and Milton, across the Vermilion River in Lafayette Parish.

The Civil War

Former Governor Alexandre Mouton presided over Louisiana's convention of January 1861, in which the delegates voted overwhelmingly to secede from the Union. At least initially, Lafayette Parish enthusiastically supported the formation of the Confederate States of America, but some local patriotism abated when the Pelican State was subjected to a Federal invasion. In April 1862, New Orleans fell to United States troops, and, by the Spring of 1863, General Nathaniel Banks was advancing up Bayou Teche with 20,000 Federal troops. A much smaller group of Confederates, commanded by General Richard Taylor, contested the Federal advance. The Confederates fought effectively but were forced to retreat.

The Teche Campaign was part of the grand Federal strategy to split the Confederacy by gaining control of the lower Mississippi River. Union command of the western tributaries of the Mississippi River was considered necessary to the success of this objective. Additionally, Federal occupation of the Teche country would help terminate the southwestern Louisiana supply line from Texas and the Attakapas region to Confederate forces east of the Mississippi River (Raphael 1975:54; Winters 1963:221-241).

After capturing New Iberia and destroying the salt works on Avery Island in April of 1863, the Federal commanders divided their forces. The Union left proceeded from New Iberia directly to the Pinhook Bridge over the Vermilion River below Vermilionville. The Union right advanced up the west bank of Bayou Teche to St. Martinville; from there, the Federal troops crossed westward to the Vermilion River and the Pinhook Bridge (Figure 17) (Raphael 1975:141).

On April 17, 1863, the Federal left, on a direct route from New Iberia to Vermilionville, arrived first at the Pinhook Bridge as General Taylor and the last of his supply wagons crossed the river. As the last Confederate wagon reached the other side, Taylor ordered the bridge destroyed. After they set the bridge ablaze, the Confederates positioned their infantry and artillery around its upper approaches to engage the advancing Federal forces. Although the two armies struggled for about four hours, there were few casualties. When Taylor was satisfied that most of the Confederate troops and their wagon train were safe, he withdrew his rear guard from the bridge (Raphael 1975:145-147).

The Federal army constructed a pontoon bridge the next day to pursue the retreating Confederates. While awaiting the completion of the bridge, almost half the tired and dirty Federal troops stripped off their clothes and jumped into the river. Considerable confusion resulted when a troop of Taylor's Confederate cavalry swooped down to the opposite bank and opened fire on the naked men. One observer described the scene:

> Such a spectacle never before was seen. The long [drum] roll was

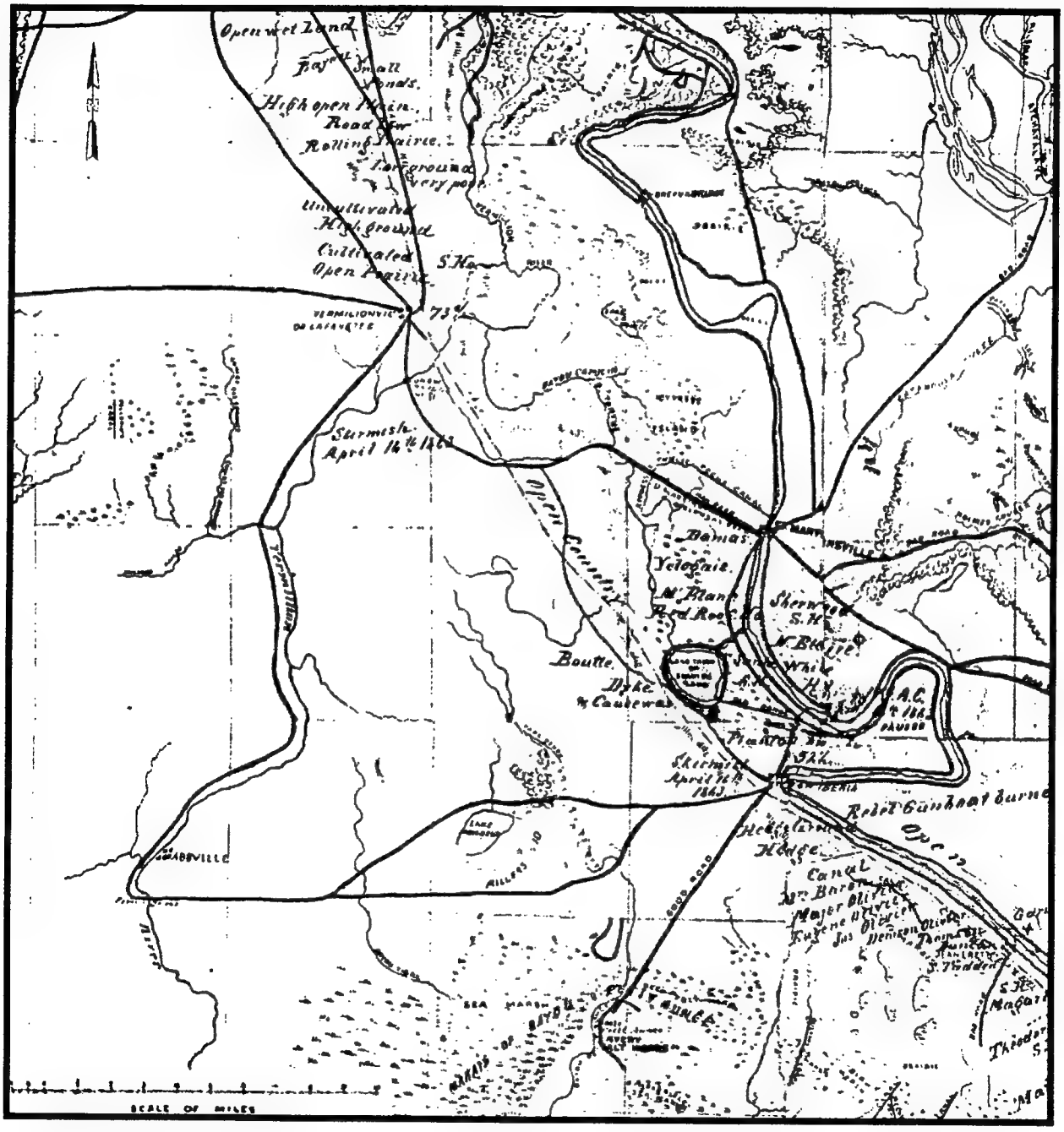

Figure 17. Excerpt from Abbot's 1863 *Department of the Gulf, Map No. 8: Atchafalaya Basin.* Excerpt depicts features of the countryside between New Iberia and Vermilionville, including the Avery Salt Works to the south. The skirmish notation of April 16, 1863, either refers to an incident en route to the Pinhook (Vermilion) drawbridge or is a transcription error regarding the April 17 confrontation at the bridge

> sounding and naked men, in every direction, were making a dash for their guns, trying to dress as they ran. Some with their trousers on hind side before; didn't know whether they were advancing or retreating. (Raphael 1975:147, quoting [?] Irwin).

The invasion of the Teche in the Spring of 1863 provided no strategic victory for the Federal cause. The army was withdrawn in the summer to besiege Port Hudson on the Mississippi River. That autumn, however, Federal troops once more advanced up the Teche, this time in an overland expedition intended to plant the United States flag in Confederate Texas. The citizens of the Teche were dismayed by the return of the Federal troops. Two successive invasions inflicted especially severe hardships on the civilian population.

At New Iberia, the Federal invasion force took the stagecoach road across the prairies to Vermilionville. On October 9, 1863, as the Federal invaders approached the Pinhook Bridge over the Vermilion River, they found the span ablaze once more. Like its predecessor, the second Pinhook Bridge was located where present-day Highway 182 crosses the Vermilion. The bridge had been rebuilt since its burning in the Spring, but the Confederates again destroyed the structure to slow the Federal advance (Figure 18) (Edmonds 1979:82-85; Jones 1961:320).

At 11 a.m. the Federal forces attacked, and a skirmish ensued. According to one Confederate from Texas, "We withdrew in brisk fashion" (Edmonds 1979:86). In this second engagement, Federal troops secured a bloodless victory for the Union. They once more replaced the destroyed Pinhook Bridge with a temporary span, but the new bridge would not support the heavy artillery and wagons that accompanied the Federal advance (Edmonds 1979:90). The Federal army then pursued the Confederates northwestward to Opelousas, which the Union forces occupied until the end of October (Winters 1963:297-298).

Following the Battles of Vermilion Bridge and Vermilion Bayou, the project vicinity remained relatively quiet through the end of the Civil War. In early 1865, there were a few reports suggesting possible blockade running out of Vermilion Bay and other area waterways, but there was no significant activity noted by either Confederate or Federal officers monitoring the region (U.S. Secretary of War 1896:48[1]:722, 1441).

The Postbellum Era

In Louisiana, as in other Southern states, the postbellum period was an era of recovery from the aftermath of the Civil War. Besides the upheaval in politics, with many former slaves enfranchised as voters, Southerners had to find a way to conduct business in a cash-poor economy; planters in particular had to find a way to pay former slaves for their labor. The tenant farming and sharecropping systems emerged in response to these needs, and they were in place by 1868.

Sugar cane cultivation in southern Louisiana revived during the postbellum era largely because the processing of cane became more centralized. Before the Civil War, most planters had maintained their own sugar houses. After the war, with the economy in shambles and many sugar houses destroyed, planters eventually began to send their cane elsewhere for processing. As a result, there were fewer sugar houses, but much greater sugar production, since the newer sugar houses were more efficient than their antebellum predecessors. (Goodwin et al. 1985:68-69; Griffin 1959:106). A politician visiting southwestern Louisiana noted that "Under the old system it took a mint of money to run a sugar plantation" (Perrin 1891). He then described the shift toward centralization as follows:

> . . . the future of the sugar business seems to be in the new system, which, in brief, is to separate the agricultural part of it from the manufacturing part. They speak of it in Louisiana as the Central System. A man or a company puts up a sugar

> house in some convenient center and buys the cane brought to him. This enables the planter to farm on either a large scale or small scale (Perrin 1891).

As predicted, this trend continued through the turn of the century (Griffin 1959:106).

Several examples of the late nineteenth century trend toward the centralization of sugar processing existed in the project vicinity. These included the Billeaud Sugar Factory in Broussard, east of the Lafayette Parish project corridor, constructed in 1889, and the Lafayette Sugar Factory, which was established in 1895 by Colonel Gustave Breaux, A. B. Denbo et al., along the Southern Pacific Railroad, perhaps 2.5 km (1.5 mi) above the Pinhook Bridge and approximately 500 m (1,640 ft) west of the project corridor. This concern subsequently was purchased by a New Orleans-based partnership and became known as the Lafayette Sugar Refining Company (Griffin 1959:106-107; Sanborn [Sanborn] 1921:1).

After the Civil War, Lafayette and Vermilion Parishes were included in an area touted in promotional literature as the "Rice Belt." As was the case with sugar production, new methods in rice cultivation helped to establish rice as an important crop. In the 1880s, new methods of rice cultivation were introduced into southwestern Louisiana, including the use of machinery such as twine-binders, threshers, and mowers. According to one source: "Under the impetus of the profits made by rice growers, a rice craze seized upon southwestern Louisiana . . . . Two years ago [ca. 1890] there were but 12,000 acres in rice in that section of the state. Today the acreage is 179,900" (Goodspeed 1892:211).

Throughout the rice-producing parishes, irrigation canals fed by water pumping stations were built; canal companies owned the pumping equipment. In exchange for raising levees to build the canals and for other services, the canal companies shared in the profits of the rice crop. A partial list of canals and pumping plants published in 1904 included six plants to be constructed in the vicinity of Abbéville, south of the project corridor in Vermilion Parish. The six plants already in operation irrigated a total of 52,800 acres. Between 1899 and 1904, approximately 25 rice cleaning mills were built in the "Rice Belt" region of Louisiana (Southern Pacific 1904:n.p., 12, 22).

The late nineteenth century also brought advances in cotton agriculture. In 1870, Lafayette Parish planters produced only 6,234 bales of cotton using horsepower-driven gins. Steam power was introduced to the parish cotton gins ca. 1876, when Avignac Arceneaux built his steam-propelled gin at Carencro, north of Vermilionville and the project corridor. Arceneaux's gin had a capacity of five bales per day, but subsequent gins built there had an increased capacity ranging from 35 to 40 bales per day. Cotton gins later were constructed in Broussard, Lafayette, Milton, and other parish towns. Another boost to the area cotton economy was the establishment in 1896 of the People's Cotton Oil Company, which produced cotton-seed cake, meal, oil, and other products from the cotton seed processed at its mill. During the early twentieth century, this enterprise added a cotton gin and two ice plants to its manufacturing facility, which was located along the Southern Pacific rail line northwest of the project corridor (Griffin 1959:107; Sanborn 1921, 1928, 1940).

As noted in the preceding paragraphs, important agricultural processing facilities were constructed near the railroad tracks extending through Vermilionville/Lafayette. The coming of the railroad certainly aided area agriculture by facilitating the transport of crops and products and also by opening up access to technological advances, which, in turn, generated greater yields from the processed crops. The railways thus drastically altered the economy in the project region, helping the district to emerge from the poverty that it had experienced since the Civil War.

Although a railway had been projected to Vermilionville before the Civil War, plans for a rail connection to New Orleans were not revived until 1869. After many delays and difficulties, Morgan's Louisiana and Texas Railroad reached Vermilionville in 1880, and a railway bridge was built across the

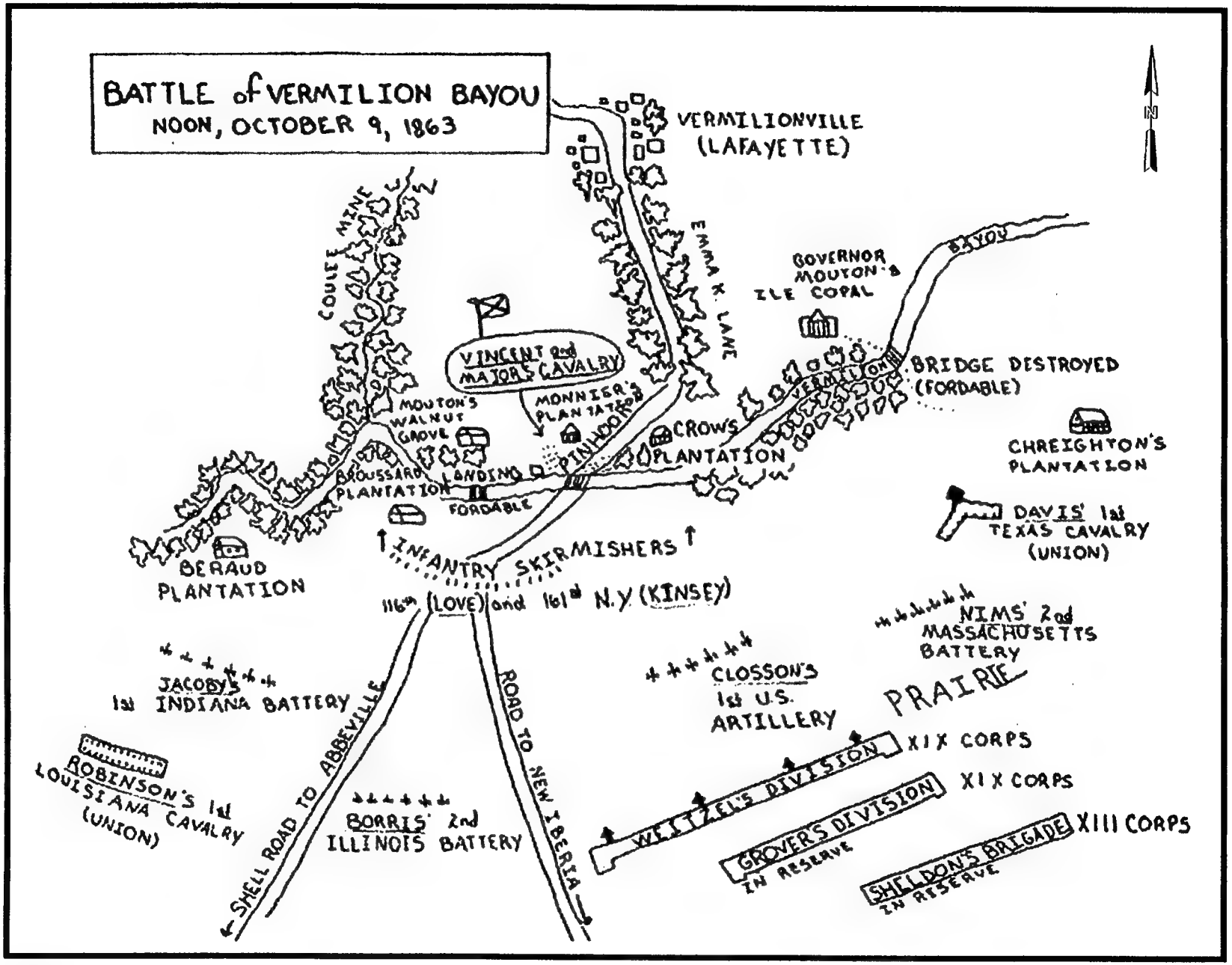

Figure 18. Battle of Vermilion Bayou (Edmonds 1979:87)

Vermilion about 2.5 km (1.5 mi) above the Pinhook Bridge. A year later, the east-west Louisiana Western Extension of the Louisiana and Western Railroad was completed between Vermilionville and the Sabine River town of Orange, Texas, where the railway connected with another line to Houston (Figure 19). By early 1883, one could travel from New Orleans via Lafayette to San Antonio, and after a day's delay there, take another connection to San Francisco, California. Both of the rail lines extending through Vermilionville later were absorbed into the Southern Pacific Railroad system (Figure 20) (Griffin 1959:88-89).

Improvements in transportation aided the development of the towns of the region. The railroads brought more traffic and industry through Vermilionville and other communities that previously had existed primarily as river landings. In fact, it was not until the rail lines were completed to Vermilionville that the town experienced much expansion at all. As streets were extended to the railroad, more businesses were established in that direction, and, eventually, the old community of Pinhook and its bridge were absorbed by the growing parish seat (Griffin 1959:56-58). Once referred to by author George Washington Cable as "the sorry little village of Vermilionville," the town became a thriving regional hub with a population of 3,314 by the turn of the century (Griffin 1959:57-58).

In 1884, the Vermilionville town charter was amended in order to change its name to LaFayette, which spelling was altered to Lafayette in 1925 (Figure 20). Although the original post office had been established as Lafayette at the Pinhook community in early 1817, the name of the nearby parish seat remained Vermilionville from the mid-1820s until 1884. The nearly eight-year existence of that first post office no doubt contributed to the conflicting labels given on nineteenth century maps, which sometimes called the town Lafayette rather than Vermilionville. According to one local source, the name change was held until the City of Lafayette that existed as a suburb of New Orleans was absorbed within the municipal limits of the larger city; however, that annexation was effected in 1852, long before the name amendment of the Lafayette Parish governmental seat (Griffin 1959:37, 115-116).

Like Vermilionville/Lafayette, the town of Broussard (located on the southeastern edge of modern Lafayette) benefited from the extension of the railroad through the area. Soon after the Civil War, Valsin Broussard acquired the site of the town that bears his name today, and ca. 1870 he hired a surveyor to lay out the community near the old Acadian *Côte Gelée* settlement (Figure 19). A post office was established there in 1878, and Broussard was incorporated in 1884, four years after the rail lines were completed (Figure 20). The local government soon became so unpopular that the citizens allowed the charter to lapse; however, Broussard was re-incorporated in 1906. Although a small town and located east of the project corridor, the development of Broussard has significance to this study because of the enterprises situated there, particularly the Billeaud Sugar Factory, which influenced the economy of the immediate region (Griffin 1959:73-74).

Other communities impacting the growth of Lafayette and the project region include Carencro, Scott, and Youngsville, all of which had antebellum beginnings, but marked their modern development with the late nineteenth century construction of railroads through the area (Figure 20). Besides Lafayette, the only town actually located along the project corridor is Milton, situated at the base of the corridor. Settlement occurred in the Milton vicinity as early as 1823, the year that Lafayette Parish was established, but the village dates from after the Civil War. John Cushman, who settled there ca. 1870, named the town for one of his younger sons, Milton Cushman, a physician who practiced medicine for many years in New York City. Prior to his move northeast, Dr. Cushman supplemented his medical income by serving as the first postmaster of Milton. The village was not surveyed until 1910 and, although reportedly incorporated for a short time during the mid-twentieth century, it is presently unincorporated (Griffin 1959:72-75; St. Joseph Catholic Church n.d.).

The Twentieth Century

The lands bordering the project corridor remained "a series of cane, cotton and corn fields" until 1900. The establishment nearby of Southwestern Louisiana Institute in 1901 had an important influence on the development of the city and the region. Other significant influences on area economic growth included the completion of the railroad network, the construction of a paved highway system centered on Lafayette, the exploitation of area timber resources, and petroleum exploration.

In spite of late nineteenth century improvements to navigation along the Vermilion River, the railroads provided a more dependable means of transportation through the Lafayette region than did steamboats or other river vessels. The expansion of rail facilities encouraged further industrial growth. Agricultural processing facilities were constructed near the Lafayette railways in order to facilitate the transport of refined sugar, cotton-seed oil, and other products. Both the Lafayette Sugar Refining Company and the Peoples Cotton Oil Company continued to operate well into the twentieth century (Sanborn 1921, 1928, 1940). During the 1920s, these trackside manufacturing complexes were joined by the Texas Company Lumber Mill and the Star Salt Company, both of which were located along Vermilion Bayou at the foot of the railway spurs that branched southeast from the main track of the Southern Pacific Railroad, upstream from the railroad bridge (Figure 21). According to the 1928 Sanborn fire insurance map, one of these spurs once crossed a bend in the bayou.

By 1940, however, that bridge no longer existed. By that time, the lumber mill and salt company had been replaced by B. F. Trappey's Sons, Inc. canning factory. In addition, most of the residences that formerly existed to the west along Dorset Place and the railroad tracks had been replaced by meatpacking concerns – the Evangeline Live Stock Exchange, the Evangeline Packing Co. (a wholesale meat and packing plant), and the Dominique Slaughter House. Farther up the railroad line, the former site of the Lafayette Sugar Refining Company was occupied by the Lafayette Concrete Pipe Co., Inc., and the Louisiana Building Supply Co., Inc. (Figure 22). During the next several years, B. F. Trappey & Sons expanded its canning facility; the Evangeline Packing Co. was replaced by L. A. Frey & Sons, Inc., another wholesale meat and packing plant, Little & Co., Inc., added a dehydration plant to the trackside processors along Vermilion Bayou. Lumber concerns also established facilities on the old Louisiana Sugar Refining Company grounds and closer to the bayou (Figure 23). These enterprises were depicted on the Sanborn's fire insurance maps; however, unfortunately, most establishments that were built along the Vermilion River and Bayou were not included in this survey because that area remained outside of the Lafayette corporate limits.

Rail transport began to decline during the mid-twentieth century due to the popularity of automobiles and to improved highway systems. The chief blow to rail transportation in the project region was the destruction of the railroad bridge across the Atchafalaya River during the flood of 1927. Until that time, there had been regular passenger and freight "through service" between Lafayette and Baton Rouge (Griffin 1959:89).

In 1914 - 1915, the city of Lafayette sponsored the first area plan to replace dirt roads with gravel-surfaced thoroughfares. In 1918, a $300,000.00 bond issue in Lafayette Parish financed a system of gravel roads that connected Lafayette with the governmental seats of all adjacent parishes; state and federal governments added $200,000.00 to this roadbuilding effort. By the late 1920s, though, gravel roads were becoming increasingly inadequate for the burgeoning automobile-owning population (Griffin 1959:89-90). Consequently, in 1928, Governor Huey P. Long proposed a 100 million dollar statewide bond issue to "lift Louisiana out of the mud" (Griffin 1959:90). Lafayette-area residents heartily approved of the Governor's plan. Implementation of this program had an important influence on southwestern

Figure 19. Excerpt from Rand, McNally & Co.'s 1881 map of *Louisiana*, depicting southern Louisiana towns and railroad lines

Figure 20. Excerpt from Rand, McNally & Company's 1899 map of Louisiana, from *Indexed Atlas of the World*. Excerpt depicts southwestern Louisiana towns and railroads in the vicinity of the project area

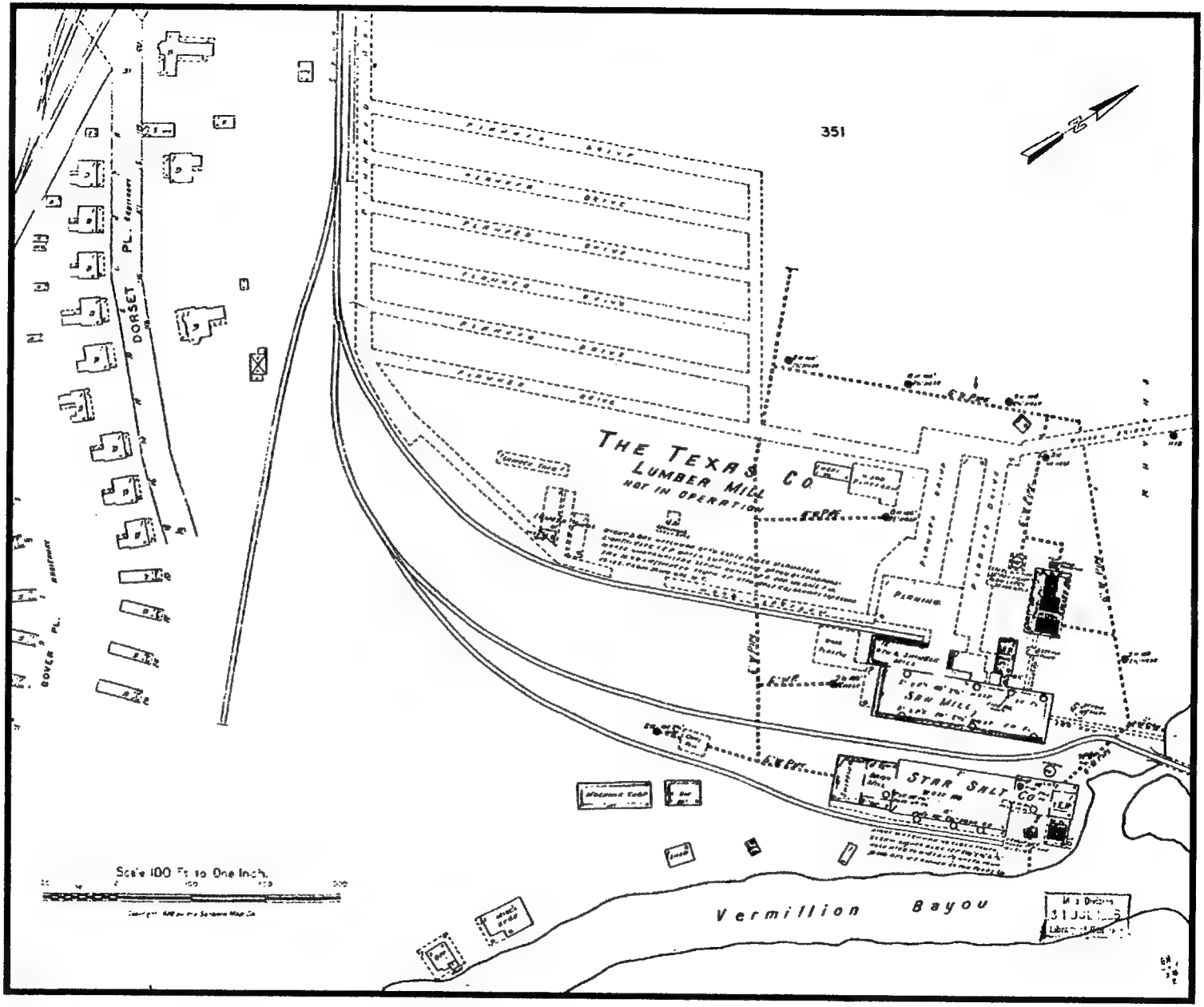

Figure 21. Excerpt from Sheet 30 of the Sanborn's 1928 *Insurance Maps of Lafayette,* showing that portion of the project corridor extending through the present-day city of Lafayette. Excerpt depicts the Texas Co. Lumber Mill and the Star Salt Co

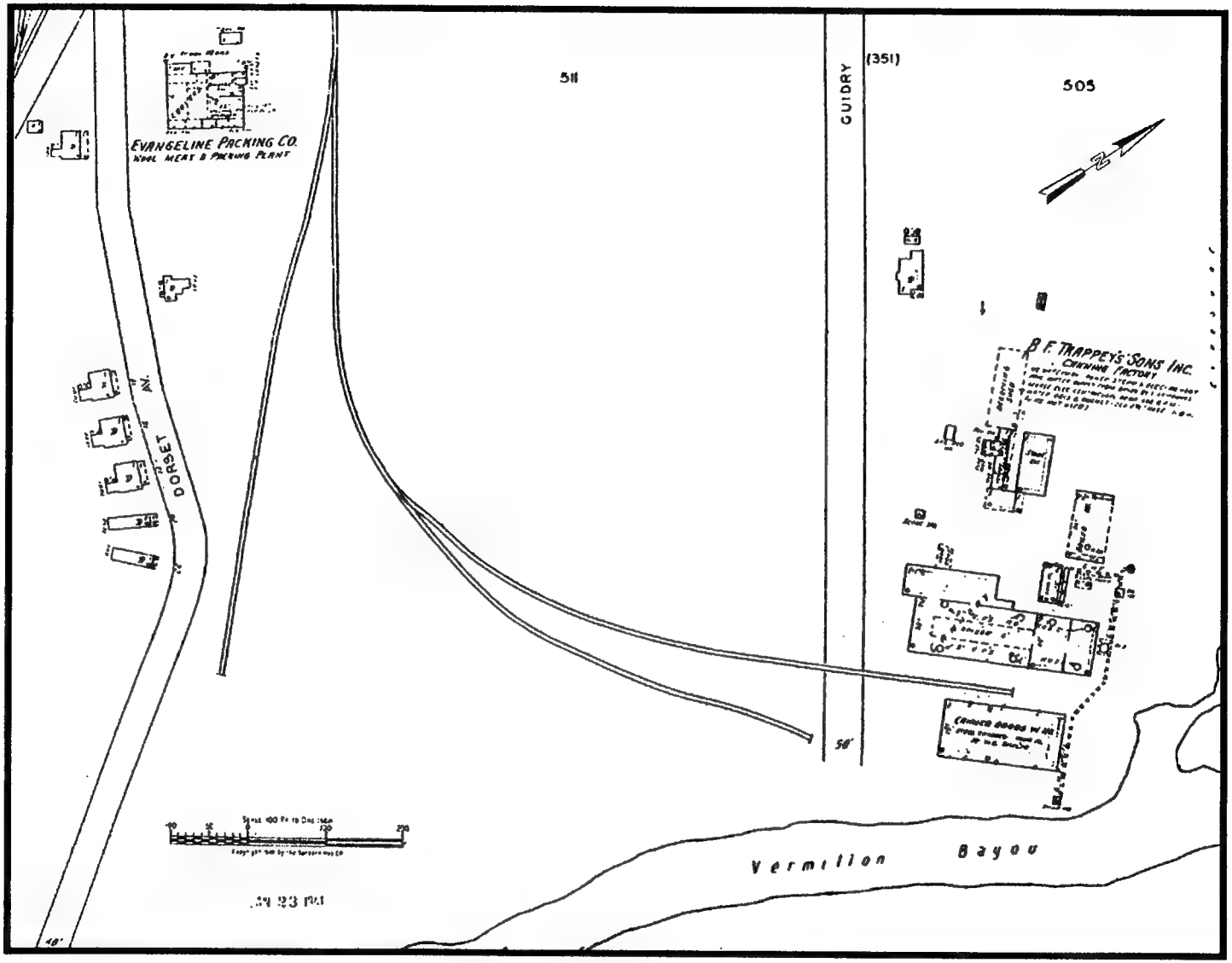

Figure 22. Excerpt from Sheet 30 of Sanborn's 1940 *Insurance Maps of Lafayette,* showing that portion of the project corridor extending through the present-day city of Lafayette. Excerpt depicts the B. F. Trappey's Sons canning factory and the Evangeline Packing Co. wholesale meat and packing plant

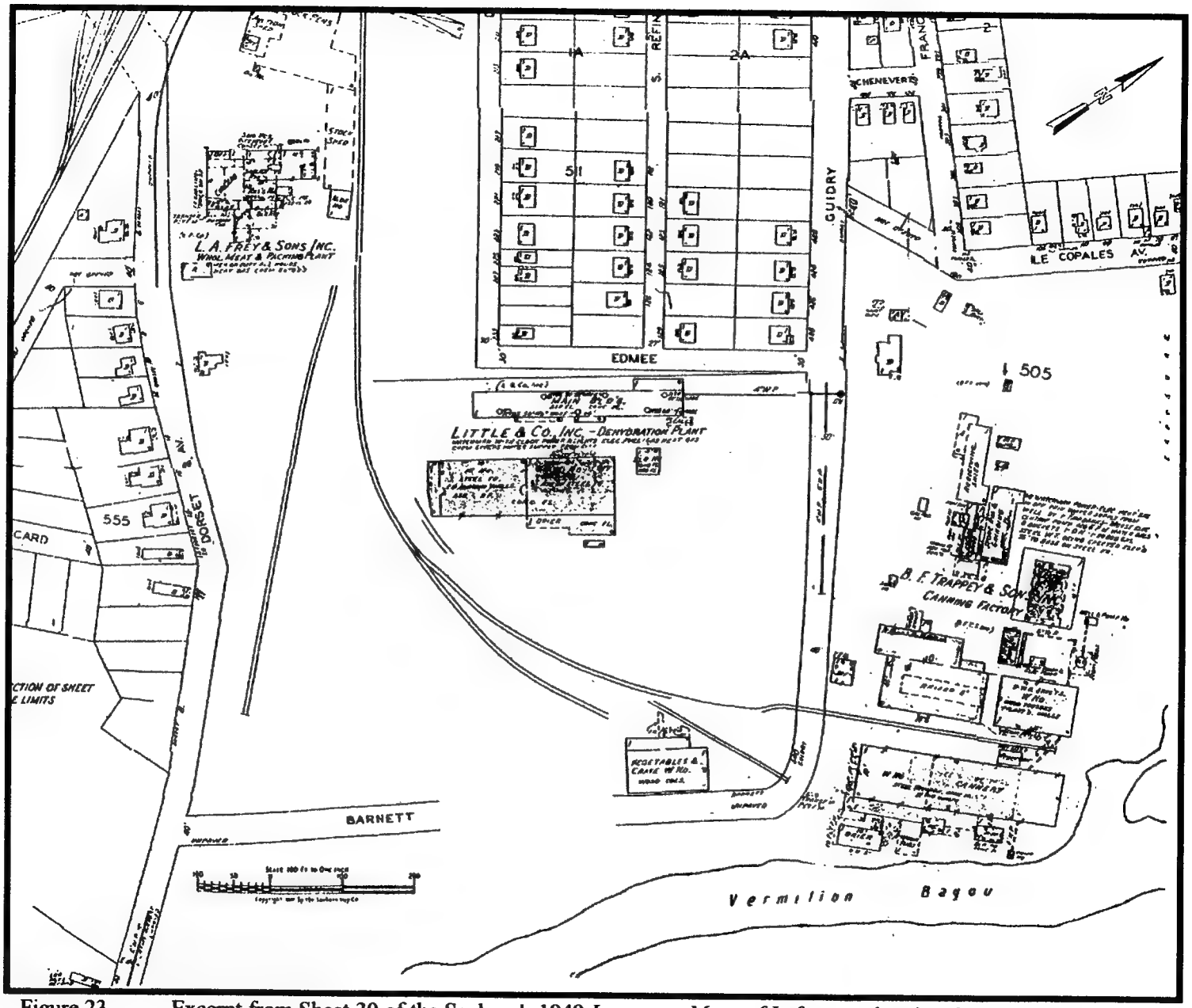

Figure 23. Excerpt from Sheet 30 of the Sanborn's 1949 *Insurance Maps of Lafayette,* showing that portion of the project corridor extending through the present-day city of Lafayette. Excerpt depicts the B. F. Trappey & Sons canning factory, the L. A. Frey & Sons wholesale meat and packing plant, and the Little & Co. dehydration plant. The lower left-hand corner of the excerpt also includes a notation of "LBR [lumber] PILES BEYOND" the bounds of the survey

Louisiana. As a result of this bond issue, state funds were contributed to the construction of a federal highway, U.S. 90 (the Old Spanish Trail), which was completed through Lafayette Parish to Lake Charles in 1931. The hard-surfaced roads connecting Lafayette to Carencro and Breaux Bridge were finished in 1932, and the paved links to Abbéville and Opelousas were in place by 1938 (Griffin 1959:90).

The twentieth century brought a brief timber boom to the project region. There had been small sawmills along the Vermilion River and Bayou since the antebellum era; however, not until after the turn of the century did large lumber concerns build mills in the area. In 1920, the Baldwin Lumber Company was constructed near the Southern Pacific Railroad spurs along the bayou and north of the rail bridge. This facility apparently became known as the Texas Co. Lumber Mill later in the decade (Figures 21-22). Cypress logs were cut in the swamps surrounding Lake Martin (east of the project corridor in St. Martin Parish), and then processed at the Baldwin mill at the rate of 100,000 board feet per day. By 1927, though, the Baldwin/Texas lumber facility, which once employed 600 men, had been abandoned, apparently before the great flood of that spring struck the area (Figure 24) (Griffin 1959:111, 158). Other twentieth century lumber enterprises included the Hopkins Bros. Co., Lafayette Lumber Co., Mouton Lumber Co., the L. D. Nickerson Coal and Wood Yard, Burdin Lumber Co., Southern Lumber and Sales Co., Roy Lumber Co., Savoy Lumber Co., and the Farmers Lumber & Hardware Co. These other facilities generally were located near the Lafayette railroad tracks and away from the Vermilion River/Bayou (Sanborn 1921:1, 1928:1, 1940:1-2, 1949:1-3).

In 1896, oil exploration began in the Anse La Butte Field of St. Martin Parish, just northeast of the project corridor, and drilling in that area commenced in earnest in 1907. By the late 1920s, petroleum exploration had progressed south into Vermilion Parish. In 1928, the Lafayette Oil Co., Magnolia Petroleum Co., Pan-American Oil Co., Pierce Oil Co., Prudhomme Oil Co., Sinclair Oil Co., Standard Oil Co., and the Texas Co. (petroleum products) all occupied offices in the city of Lafayette. Attracted by Lafayette's central location and its hospitality to industry, many more petroleum companies, with landmen, production men, field supervisors, geologists, engineers, marketing supervisors and other personnel, as well as numerous individuals and companies involved in support services, moved into the community around 1940. In 1952, an oil center, or petroleum industry complex, was established between Pinhook Road and Girard Park, less than 1 km (0.6 mi) west of the project corridor (Griffin 1959:113-114; Sanborn 1928:1; St. Martin Parish Development Board [SMPDB] ca. 1950; VPDB ca. 1965:19). According to one local historian, "Thus began the move that has made Lafayette the oil center of all South Louisiana and has changed the face and character of the city" (Griffin 1959:114).

Navigation and Commerce along the Project Corridor

The Vermilion River project corridor extends through a region that experienced little development until the nineteenth century. As noted previously, Bayou Teche, to the east, was a more important and reliable transportation route. The federal government did not undertake maintenance of the Vermilion River during the antebellum period, but the local police jury of Lafayette Parish subsidized snag removal on the river during the 1840s (Griffin 1959:86-88). Because significant improvements were not undertaken along the Vermilion River until after the Civil War, this discussion will begin with the postbellum era. In this section, vessel dimensions, weights, and drafts will be described using the English system of measurement because that system was used during vessel construction. Waterway distances also are stated in English measurements, since the river mile is a standard navigational distance measure, and because river depths correspond to vessel drafts.

Postbellum Navigation and Commerce

During the late nineteenth century, navigation on the Vermilion continued to present many problems. The river did not compete successfully with the railroad, nor did shipping on the river work in tandem with the new rail network that crossed the region. On March 3, 1879, the U.S. Congress passed a river and harbor act charging the U.S. Army Corps of Engineers with surveying Bayou Vermillion [sic] and other waterways in preparation for the commencement of navigation improvements (COE 1879:1:112). The passage of this act marked the beginning of federal channel work along the Vermilion River/Bayou.

In 1880, following the initial river survey conducted by Major C. W. Howell, Congress appropriated $5,000.00 to improve the Vermilion River "by removing from its banks all overhanging trees, and from its bed all trees, logs, snags, and other obstructions to a depth of 5 feet below low-water mark, or, where such depth does not exist, to the bottom of the river" (COE 1880:2:1157). The objective was "to obtain a channel of navigable width and depth from the railroad bridge above Vermillionville [located approximately 3.2 - 4.8 km (2 - 3 mi) upriver from the Pin Hook Bridge] to Vermillion Bay" at the mouth of the river [sic throughout] (COE 1881:1:192). A private contractor began the work in July of 1881, and completed a 22-mile stretch from the railroad bridge downriver (past present-day Milton) by early September (Figure 25). The obstructions over the remaining distance were removed during the next year, following the appropriation of additional funds (COE 1880:1:143, 2:1157-1158; 1881:2:1281-1282; 1882:2:1373-1374; 1883:2:1106).

The 1883 *Annual Report of the Chief of Engineers* cited shipping statistics provided by the district clerk that reflected the increased Vermilion River commerce credited to these early channel improvements (Table 2). According to the report, the clerk stated:

> . . . that almost all of the products enumerated . . . are shipped down the Vermillion River in consequence of boggy roads leading to the railroad; that real estate has increased 100 per cent within the last two years, and steamboatmen say that the commerce of the river has increased 200 per cent within the last year [sic throughout] (COE 1883:1106-1107).

Table 2. Comparison of agricultural products shipped down the Vermilion River in 1870 and 1882 (Chief of Engineers 1883:2:1107)

	1870		1882	
Products	**Shipped in 1870**	**Product Value**	**Shipped in 1882**	**Product Value**
Sugar	398 hhds	$23,880	3,071 hhds	$182,160
Molasses	597 bbls	$ 8,955	5,480 bbls	$ 82,250
Rice	941 bbls	$ 3,780	3,900 bbls	$ 15,600
Cotton	545 bales	$27,250	3,072 bales	$153,600
Total product value		$63,865		$433,610

Although the work was not considered "of a permanent character," because navigational obstructions were prone to re-form, the improvements certainly were regarded as successful groundwork for future projects (COE 1883:1107).

In 1886, the federal government authorized a preliminary examination of navigation on the Vermilion from Abbéville upstream to the Louisiana and Texas Railroad bridge at Lafayette. O. T. Crosby, First Lieutenant of Engineers, made the survey. He found first that the work conducted during the early 1880s had been "done by contract, and, so far as I can learn, not well done" (COE 1887:2:1399). He also noted that vessels navigating the Vermilion River continued to experience navigational difficulties (COE 1887:2:1398-1402). For example, the *Barmore*, a steamer of considerable size (approximately 140 ft long by 30 ft beam), had difficulty entering the Vermilion across a bar at the mouth of the river. Nevertheless, after crossing the bar, the steamer, which drew three feet, could proceed up the Vermilion for about 15 miles above Abbéville, i.e., just above the present-day community of Milton. Running under contract to the Southern Pacific Railroad, the *Barmore* delivered

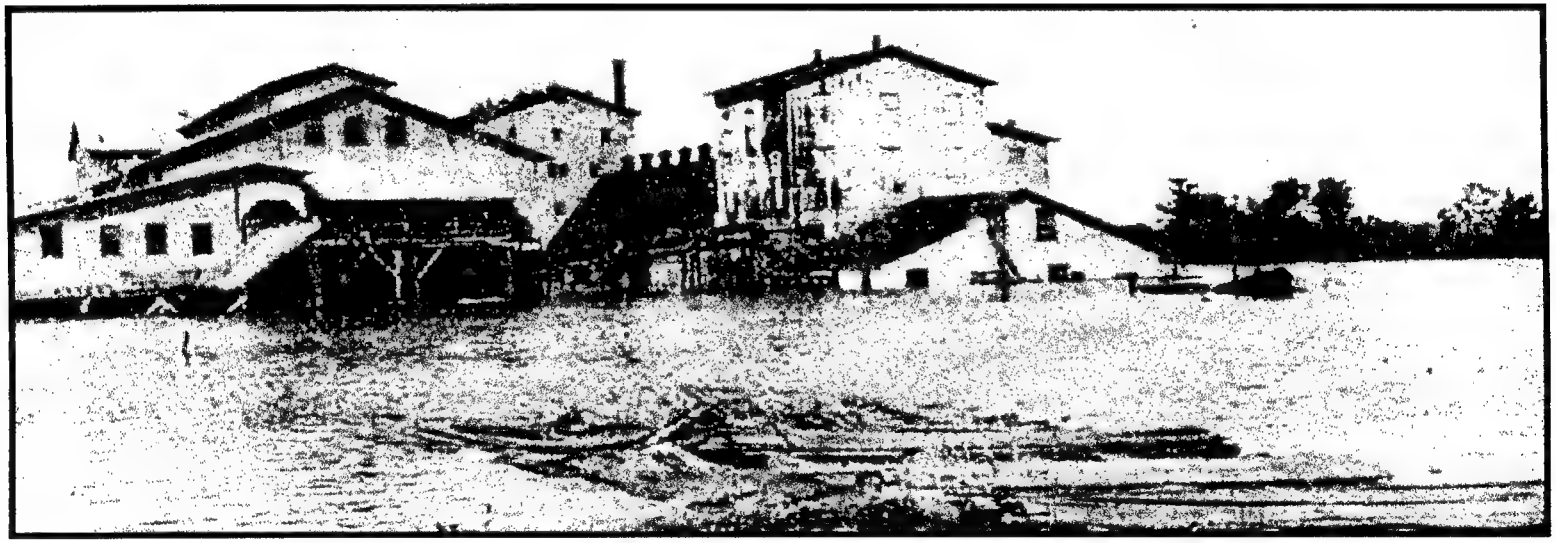

Figure 24. Photograph of the "Saw Mill plant of Baldwin Lumber Co. under water" during the flood of 1927 (Griffin 1959: opposite index)

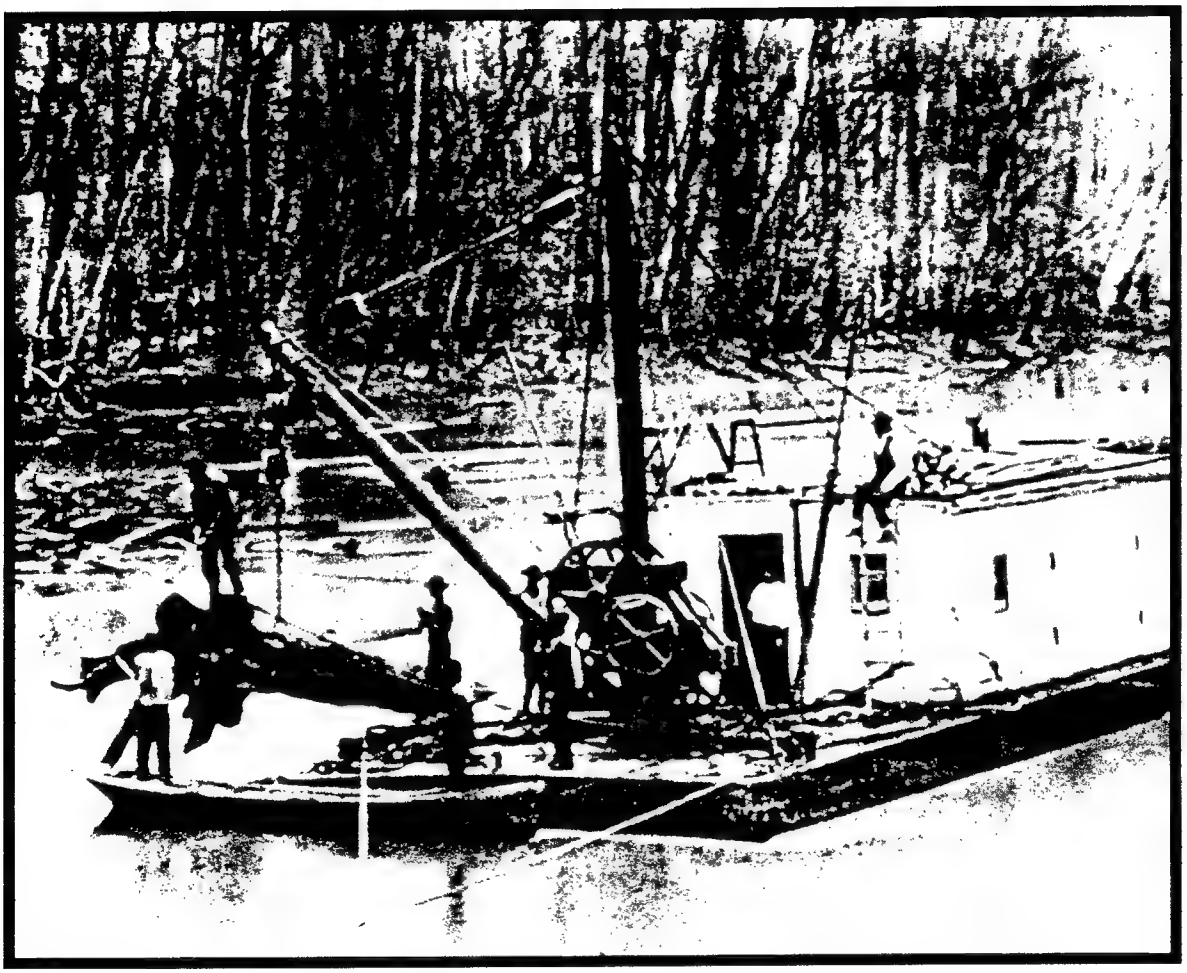

Figure 25. Example of a common snag boat used on small bayous to clear obstructions (Wilby 1991:60)

freight weekly to the railway, but was losing money in the effort. The *Josephine Spengler*, a smaller craft (100 ft long by 25 ft beam) that ran in conjunction with the *Barmore* during harvest season, could travel another two to three miles upstream. Above that point, only a very small tug-boat, drawing barges (Figure 26, Typical wooden barge of the kind used on the Vermilion River, Gandy 1987:54), [running] at irregular intervals" could continue upriver to the Pinhook Bridge (COE 1887:2:1399).

Crosby's report stated:

> Three or four years ago a steam-boat, of nearly the same dimensions as the *Spengler*, ran over the whole of this section, delivering goods at Pinhook Bridge, then running out of the Vermillion [sic] along the Gulf coast to the Atchafalaya, thence to the head of the Atchafalaya, then down the Mississippi to New Orleans.
>
> This trip, something like 550 miles in length, was made in opposition to the railroad, the distance [by rail] from Lafayette to New Orleans being 144 miles. The steam-boat, working at such disadvantage, could not maintain its cause (COE 1887:2:1399).

Furthermore, when the little steamboat ceased operations, snags again clogged that section of the river. Continuing his report, Crosby noted that even if the obstructions were cleared, "the width and depth [of the river channel] are such that only small boats could pass at low water" (COE 1887:2:1399).

Examining the river from 15 miles above Abbéville to the Pinhook Bridge, Lieutenant Crosby found approximately 350 obstructions and 250 overhanging trees that impeded navigation of the stream. The area toward the Pinhook Bridge contained the most obstructions. Crosby remarked that his survey was conducted during a period of unusually low water, so that "at a point about 3 miles below Pinhook Bridge, the skiff could go no farther, being stopped by great trees lying across the bayou from bank to bank. . . . At two points the skiff had to be poled over short bars, and in the last quarter of a mile it was passed over trees lying in the bed, only with great difficulty" (COE 1887:2:1399). Clearing these obstructions would enable vessels of no more than 3 ft draft and about 20 ft beam to ascend the Vermilion River to the Pinhook Bridge (COE 1887:2:1400).

The upstream stretch of river between the Pinhook Bridge and the railroad bridge also was in bad condition, with approximately 250 channel obstructions and 175 hanging trees. Regarding this short river section between bridges, Lieutenant Crosby wrote:

> . . . Before the construction of the railroad this section was navigated by small boats, the Pinhook Bridge then having a draw. It is now a fixed bridge, and for many years has been the upper terminus of the most venturesome navigation on the Vermillion [sic].
>
> A few years ago the railroad company, at the request of the people of this vicinity, built a depot at the railroad bridge across the Vermillion [sic]. It was hoped at the time that the bayou would be sufficiently cleared of obstructions, and Pinhook Bridge so arranged with a draw as to permit boats to reach the railroad and deliver their freight directly, thus avoiding the 2-mile haul to Lafayette. Neither of these hopes was realized, the depot was not used, and navigation, even up to Pinhook Bridge, ceased (COE 1887:2:1399).

When consulted about the dilemma, a railroad official stated that the bridge depot would be reestablished only if business justified the expense. Of course, the paradox was that "the value of any improvement of this section between Pinhook and the railroad bridge depends wholly on the existence of a depot at the latter bridge" (COE 1887:2:1400). In other words, if the Lafayette depot, located

some 3.2 km (2 mi) inland, was the only railway station available, boats simply would unload their freight at the Pinhook Bridge, from which point wagons would haul the cargo along the existing road to the depot in town. Lack of a good road from the railroad bridge to Lafayette negated any reason for merchant vessels to continue upriver beyond the Pinhook Bridge (COE 1887:2:1400).

Lieutenant Crosby estimated that, if improvements were made on the Vermilion River, 3,800 bales of cotton could be shipped annually on that waterway. The Abbéville vicinity also shipped about 5,000 dozen eggs to New Orleans every month; improvement of the river would diminish the shipment time to the New Orleans market and also would facilitate mail delivery, which at that time, operated by stage coach to Abbéville from the railroad at New Iberia (COE 1887:2:1400).

Attached to Lieutenant Crosby's report was a plea for channel improvements from W. B. Bailey, editor of the *La Fayette Advertiser*. According to Mr. Bailey's letter:

> The people . . . along the bayou have no other outlet to a market but that stream, which at one time saw four or five steam-boats at its upper landing in regular trade. The trade is considerable. Right on its banks you can count four sugar-houses and six or seven cotton-gins, with several more some distance within a few miles of the banks, from the line of Vermilion Parish to Pinhook (COE 1887:2:1401).

Bailey went on to praise the self-sustaining small farmers of the region who needed better market access and transport to the railroad. He even discussed the merits of inland navigation "as a military precaution," and as relief against the railroad monopoly in the area (COE 1887:2:1401-1402).

Nevertheless, Lieutenant Crosby had to weigh the aforementioned advantages against the disadvantages of improving the Vermilion. He wrote: "As a general commercial route, Bayou Vermillion [sic], from Abbéville to the railroad bridge [near Lafayette], is not of national importance, or worthy of improvement in the sense in which I understand those words to have been used in legislation on the subject" (COE 1887:2:1401). Major W. H. Heuer, Crosby's superior officer in New Orleans, agreed with his subordinate's conclusions. He further pointed out that the Pinhook Bridge was a fixed wooden wagon bridge that could not be passed by steamers (Figure 27). Heuer determined that "the improvement, if made, would be purely local and not permanent . . . considering the present demands of commerce, this bayou is, in my opinion, not worthy of improvement" (COE 1887:2:1398).

The railroads continued to impose an adverse effect on transportation along the Vermilion River through the rest of the decade. By 1891, the crossing of Morgan's Railroad near Lafayette not only had "caused the withdrawal of the steamers on that portion of the bayou extending from the railroad [downriver] to Sebastopol Coulee" (Figure 28), but also had "caused an entire cessation of all [river] traffic above the crossing" (COE 1891:3:1856). Because of the thriving rail commerce, no efforts had been made to maintain the Vermilion channel.

Reporting in January of 1891 on his preliminary survey of Bayou Vermilion (as he referred to the entire waterway), Assistant Engineer P. H. Thompson noted that the obstructions consisted primarily of logs and overhanging trees. Discounting these impediments, the river channel between Sebastopol Coulee and Vermilion Bay (approximately 100 ft wide at the coulee to 400 ft wide at the mouth) could accommodate boats with a 5-1/2 ft draft "at all times" (COE 1891:3:1856). Pilots of the small boats that traveled the upriver section between Sebastopol Coulee and Lafayette reported a depth of no more than two feet of water above the fallen trees submerged in that part of the channel (COE 1891:3:1857).

The only manmade obstacle within the project corridor was Broussard's Bridge, located about 15 miles upriver from Abbéville and just downstream from Sebastopol Coulee. Describing this bridge, Thompson reported:

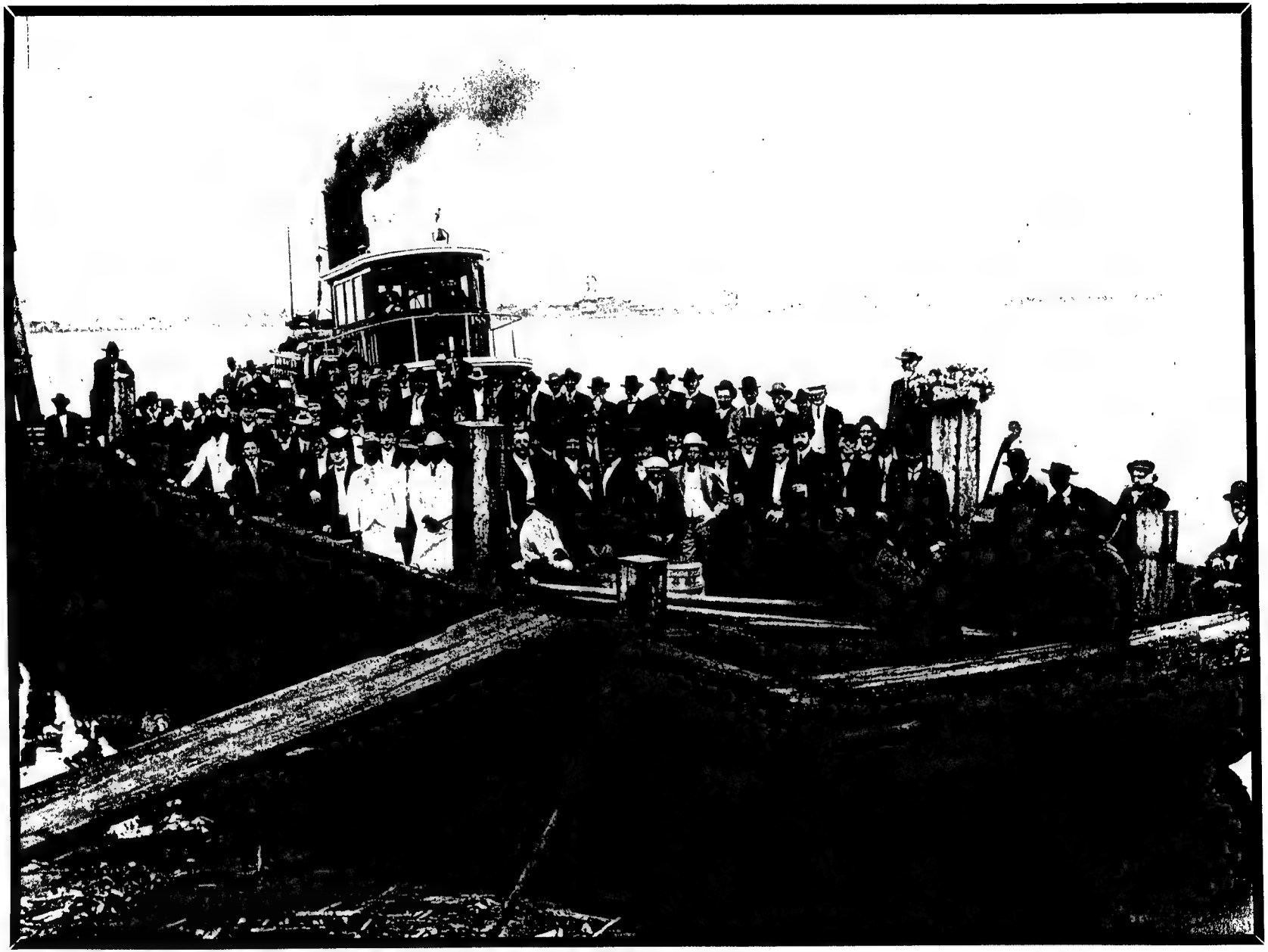

Figure 26. Typical wooden barge of the kind used along the Vermilion River (Gandy and Gandy 1987:54)

Figure 27. Photograph of the "Pinhook Bridge - 1910" (Lafayette Consolidated Government, *Centre de la Culture Acadienne et Créole,* 1998)

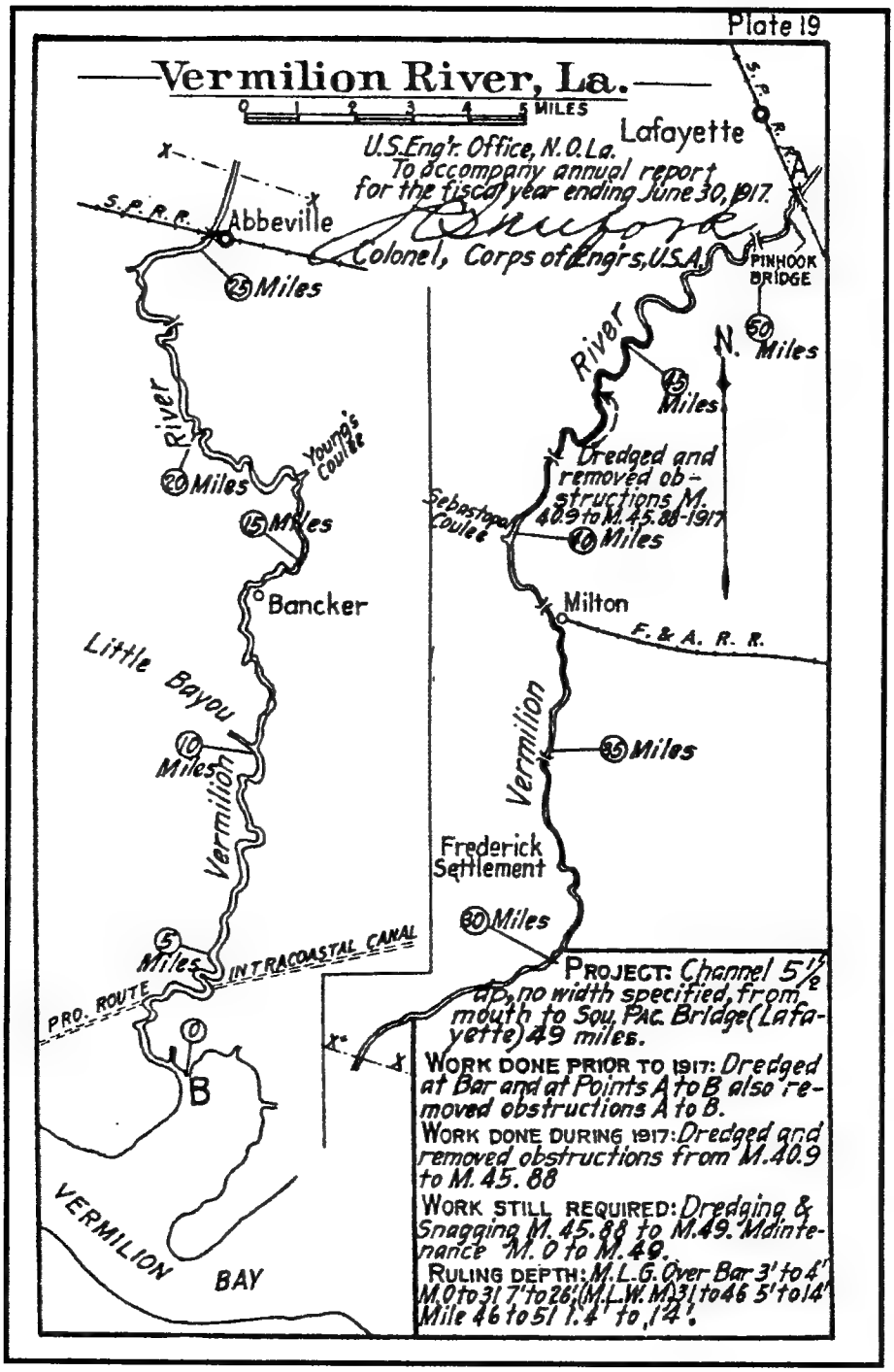

Figure 28. "Vermilion River, La." (Chief of Engineers 1917:2:Plate 19). Map depicts the Southern Pacific Railroad bridge at Lafayette; Sebastopol Coulee; and other features along the project corridor between the railway bridge and the town of Milton

> The only fault to be found with it is the location, it being in a short bend, and when a steamer is in the draw her bow and stern are both in the bushes on the banks. The location is inexcusable, as by going up the stream 350 feet the bridge could have been placed in a straight reach. There is no special danger in passing the bridge, but it causes great delay, especially when there is any wind (COE 1891:3:1856).

From this description, it appears that Broussard's Bridge was located in approximately the same location as the antebellum ferry that once connected the Broussard land grants in Township 11S, Range 4E, above the present-day town of Milton (Figure 11d) (Barde 1981:91, 282).

In detailing the area residents' need for a navigable waterway, Thompson reported the following incident:

> A very forcible example of the uncertainty of the present route has just occurred, as the only steamer now running broke down and was unable to deliver the freights. When we reached the [Vermilion] bayou they were out of supplies; in fact some of the merchants had hauled temporary supplies of groceries from New Iberia (COE 1891:3:1857).

The unreliability of the Vermilion route created numerous problems for both personal travel and area trade, causing Assistant Engineer Thompson to reverse the earlier Corps opinion by declaring the Vermilion channel improvements to be "fully worthy of the attention of the Government" (COE 1891:3:1858).

In 1892, Congress authorized the expenditure of $25,000.00 to clear obstructions and deepen the Vermilion channel to five and a half feet, from Vermilion Bay upriver to the railroad bridge at Lafayette. Snagging operations, using a privately owned snag boat (Figure 25) out of Franklin, began below Abbéville on December 1 of that year. By March 9, 1893, the stern-wheel snag boat and a crew of 14 men had cleared approximately 37.5 miles of the channel, from about 18 miles above the river mouth upstream to the Lafayette railroad bridge. Approximately 3,032 obstructions were removed during that three-month period: 2,377 overhanging trees, 416 overhanging limbs, 110 snags, 58 submerged trees, 36 stumps, and 35 logs (COE 1893:1:246, 3:1826-1827).

Two years later, the Vermilion channel improvements were pronounced "to be in good condition" (COE 1895:1:253); however, further clearing was needed above Abbéville. Accordingly, $5,000.00 was appropriated in August of 1894, and work began in early June 1895. Despite the need for additional removal of obstructions, the channel was sufficiently improved by mid-1895 that the examining engineer optimistically made the following statement:

> During the past year a steamboat made regular trips from Bayou Vermilion through to New Orleans, via the Larompe River, Grand Lake, and Atchafalaya and Mississippi rivers, which is the first time in many years that a steamer has been so employed. Although this route is a long and circuitous one, freight is carried cheaper than by the former route, part water and part rail.
>
> It is confidently claimed that with the opening of the Bayou Plaquemine route by means of locks connecting it with the Mississippi River, the time and cost of transportation will be so reduced that nearly all shipments will go by this route (COE 1895:1:254).

In anticipation of the increased usage of the Vermilion channel, obstruction removals continued through the summer of 1896 along the 26-mile river stretch above Abbéville (COE 1896:1:221; 1897:2:1766).

In 1899, more monies were released to continue the snag removals as far as the

Southern Pacific Railroad Bridge near Lafayette. Despite all the labor, however, the Vermilion River, with a channel width of 50 to 60 ft and a low water depth of 5 ft, was navigable at the end of the nineteenth century only for the 34 miles from its mouth to Broussard's Bridge, an estimated 15 miles upstream from Abbéville (COE 1899:1:328-329, 2:1851; 1900:1:373-374, 3:2262). This distance would have included only the lowermost portion of the project corridor in Township 11S, Range 4E.

By the mid-1890s, commercial freight statistics reflected the increased navigability of the Vermilion River (Table 3). In 1893, the heaviest vessels traveling the Vermilion channel had a loaded draft of 6 ft; by the following year, vessels with an 8 ft draft were navigating the river. Despite the channel improvements, river commerce experienced a decline toward the end of the decade. In 1892-1893, for example, there were 40 schooners sailing the Vermilion, but by 1899 there were only two. The principal crops shipped on the Vermilion vessels were sugar, cotton, rice, cattle, and other domestic products (Table 4). According to estimates, the value of imported articles, including coal shipments for the sugar houses, generally equaled the outbound freight (COE 1891:3:1858).

During the postbellum era, there was at least one steamboat wreck that occurred along the project corridor. On July 20, 1895, the *Assumption*, a 151 ft (or 181 ft, sources vary) x 35.8 ft x 6.5 ft wood-hulled sternwheel packet, hit a bluff bar on Bayou Vermilion above Bayou Tortue (apparently just below the present-day Highway 353 bridge that marks the upper limit of the project corridor). The *Assumption* was built in Jeffersonville, Indiana, in 1875, and had served the New Orleans - Bayou Lafourche trade route prior to taking on the more precarious New Orleans - Bayou Vermilion route. After she was beached, the *Assumption* was unloaded by the crews of the *Danube* (175 ft x 33.8 ft x 5.1 ft) and the *Stella Wilds* (156.6 ft x 30.5 ft x 4.6 ft), two sternwheelers that normally were employed along the Red River/Atchafalaya River and the lower Mississippi River, respectively (Clune and Wheeler 1991; Way 1994:32, 120, 433). Although no mention of the *Assumption* can be found in the Chief of Engineers' reports of the late nineteenth century, one source noted that "she laid up for repairs until she rotted away" (Way 1994:32).

The records of the U.S. Army Corps of Engineers noted only two shipwrecks along the Vermilion River/Bayou Vermilion during the latter part of the nineteenth century, the sidewheel steamer *Exchange* (lost in 1882) and a sunken coal barge with a full load. Both vessels sank below Abbéville (COE 1891:3:1857; 1896:3:1520; Way 1994:157). The Corps of Engineers removed the *Exchange* in the fall of 1895; however, it was assumed that the barge owner would "attempt to recover the coal and cut up the barge for fuel" (COE 1891:3:1857).

Twentieth Century Navigation and Commerce

Despite the improvements conducted along the Vermilion waterway during the last decade of the nineteenth century, the channel was not fully navigable at the turn of the century. Snagging operations never were considered permanent work because obstructions constantly continued to form on the Vermilion. By mid-1900, the river was navigable for an estimated 30 miles above its mouth for vessels with a draft of 5.5 ft; beyond that point, (i.e., the Abbéville vicinity) to the railroad bridge near Lafayette, the navigable depth was only 2.5 ft (COE 1900:1:374; 1901:1:392).

Although no improvement work was done on the Vermilion channel between June of 1900 and September of 1902, proposed bridge sites were surveyed along the waterway. Within the project corridor, plans and maps for a bridge to be constructed at D. O. Broussard's crossing in Vermilion Parish were approved by the U.S. Secretary of War in 1901, as were plans and maps for a bridge at Perry and a railroad bridge for the Iberia and Vermilion Railroad branch of the Southern Pacific Company at Abbéville. On April 4, 1907, plans were approved for the reconstruction of the bridge at the Dormas Broussard Crossing; this Lafayette Parish span, which lies within the project corridor,

Table 3. Commercial freight traffic on the Vermilion River, or Bayou Vermilion, during the 1890s (Chief of Engineers 1893:3:1828; 1894:3:1371; 1895:3:1768; 1896:3:1506; 1897:2:1766; 1898:2:1477; 1899:2:1851)

Commercial Freight Traffic	Steamers	Schooners	Barges	Totals
No. of vessels, 1892-1893	5	40	6	51
No. of trips, 1892-1893	409	40	200	619
Gross tonnage, 1892-1893	19,661	1,200	1,500	22,361
Average draft, loaded	Approx. 5 ft	---	Approx. 5 ft	N/A
No. of vessels, 1893-1894	5	7	10	22
No. of trips, 1893-1894	525	84	607	1,216
Gross tonnage, 1893-1894	22,286	7,728	26,497	56,511
Heaviest vessel draft - light, 2.5', loaded - 6'				
No. of vessels, 1894-1895	5	5	4	14
No. of trips, 1894-1895	367	113	225	705
Net tonnage, reg., 1894-1895	345	68	406	819
Gross tonnage, 1894-1895	126,315	7,685	91,350	225,350
Heaviest vessel draft - light, 3', loaded - 8'				
No. of vessels, 1895-1896	6	---	4	10
No. of trips, 1895-1896	193	---	181	374
Net tonnage, reg., 1895-1896	3,307	---	89,000	93,307
Heaviest vessel draft - light, 3', loaded - 8'				
No. of vessels, 1896-1897	2	5	11	18
No. of trips, 1896-1897	191	5	227	423
Net tonnage, reg., 1896-1897	13,561	134	22,700	36,395
Heaviest vessel draft - light, 2.5', loaded - 8'				
No. of vessels, 1897-1898	3	5	8	16
No. of trips, 1897-1898	163	5	246	411
Net tonnage, reg., 1897-1898	5,381	134	35,300	40,815
Heaviest vessel draft - light, 2.5', loaded - 8'				
No. of vessels, 1898-1899	3	2	11	16
No. of trips, 1898-1899	206	24	410	640
Net tonnage, reg., 1898-1899	7,074	252	37,560	44,886
Heaviest vessel draft - light, 2', loaded - 8'				

Table 4. Commercial freight shipped on the Vermilion River, or Bayou Vermilion, during the 1890s (Chief of Engineers 1893:3:1828; 1894:3:1371; 1895:3:1768; 1896:3:1507; 1897:2:1767; 1898:2:1478; 1899:2:1851)

Commercial Freight	Tons Shipped, 1892-1893	Value, 1892-1893	Tons Shipped, 1893-1894	Value, 1893-1894	Tons Shipped, 1894-1895	Value, 1894-1895
Lumber	1,200	$14,400	26,500	$33,000	3,582	$20,520
Rice	4,200	$83,200	1,341	$39,900	2,273	$71,271
Cotton	925	$120,250	884	$122,870	834	$96,660
Cotton seed	1,100	$13,200	1,372	$24,054	1,338	$13,380
Wood	10,000	$10,000	---	---	1,239	$1,768
Cattle	75	$50,000	1,135	$25,900	192	$8,200
Sugar	2,979	$272,765	2,611	$284,852	1,421	$146,325
Molasses	957	$31,900	201	$6,900	56	$1,014
Merchandise	12,570	$624,990	7,281	$374,151	2,058	$69,944
Coal	1,665	$6,660	2,497	$12,150	---	---
Totals	35,671	$1,227,365	43,822	$923,777	12,993	$429,172

was to be built about three miles upriver from the D. O. Broussard crossing (COE 1901:1:392; 1902:1:324, 584, 586; 1905:1:371; 1907:1:826).

Channel clearing began again in 1903. By November of that year, the Vermilion was navigable from its mouth to the Southern Pacific Railway bridge near Lafayette for vessels having a draft of 5 ft or less. By mid-1906, numerous snags had formed again, rendering the waterway navigable only as far as D. O. Broussard's landing. The steamer *Ramos* was employed to remove snags in 1906-1907, but could not operate above Dormas Broussard's Bridge in Lafayette Parish. The maximum draft allowed above that point was 3.5 ft; only a year later, the draft that could be accommodated in the upper reaches of the Vermilion had dropped to 2.5 ft (COE 1905:1:371; 1907:1:416; 1908:1:442).

In late 1909, dredging work began on Bayou Vermilion. Until that time, the channel improvements had been confined to removing obstructions from the waterway. A combined dredge and snag boat, the *Delatour*, was constructed specifically for the improvement and maintenance of the waterways in this region of Louisiana. Between December of 1909 and May of 1910, the *Delatour* and her crew cleared the 52 mile-stretch between the mouth and the Lafayette railroad bridge, "removing 4,695 snags, fallen and overhanging trees, 2 old ferry approaches, 1 sunken barge, 44 old bridge piles, and dredging 10,862 cubic yards of material from the bayou" (COE 1910:2:1620). No locations were specified for the former bridge and ferry locations or for the sunken barge site; however, the latter may have been the sunken coal barge noted below Abbéville in 1891. These dredging operations created "a channel 5 feet deep at ordinary low water in the bayou from Vermilion Bay for about 40 miles upstream and 3 feet deep for the upper 12 miles of the bayou" (COE 1910:2:1620).

With the dredging improvements, it was expected that steamer commerce could begin to hold its own with rail transport. Reduced rail freight rates already had been granted to the town of Abbéville, due to its location at the intersection of a railway and waterway. In addition, a boat line reportedly was to be established between Bayou Vermilion and New Orleans to compete with the rail lines (COE 1910:1:517).

In mid-1912, it was reported that the Vermilion channel "is considered navigable to Lafayette, 52 miles above its mouth, where it is crossed by the fixed bridge of the Morgan's Louisiana & Texas Railroad & Steamship Co.," and furthermore, "a depth of 4 feet can be carried to Lafayette at ordinary stages of water" (COE 1912:1:671-672). By mid-1917, additional dredging work had improved most of the channel above Abbéville, as far as River Mile (RM) 46 (including perhaps the lower third of the project corridor), to a bottom width of 40 ft by a depth of 5 ft. Above that point and upstream to the Lafayette railroad bridge, the depth ranged from 1.4 to 14 ft mean low water (Figure 28) (COE 1917:1:931, 2:2555).

Between 1900 and 1910, freight traffic along the Vermilion River, or Bayou, included from one to three steamers and from zero to 12 barges per year. Three sailing vessels were reported in 1901 and 12 in 1904 (Figure 29). Typical small schooners were found throughout Louisiana's bays and bayous for the transport of goods and for fishing (Coastal Environments 1991:40); however, none were recorded between 1906 and 1907 or in 1910. The number of annual freight carries made by vessels ranged from a low of 128 trips in 1906, to a peak of 705 trips in 1904 (COE 1901:3:1901; 1902:2:1343; 1905:2:1464; 1907:2:1438; 1908:2:1500; 1910:2:1621). However, vessel traffic along the Vermilion increased considerably following the early dredging operations. During 1911, the following registered freight vessels were recorded: 2 steamers, 5 gas boats, and 3 sailing vessels. Of unregistered vessels in 1911, there were 41 gas-powered boats, 7, sailing vessels, and 14 unrigged barges. Five years later, freight was shipped on 5 steamers, 6 gas-powered boats, and 3 sailing vessels; steamers also carried 5,000 passengers that year. Unregistered vessel traffic in 1916 included 50 gasoline powered boats and 25 unrigged barges (COE 1912:2:1981; 1917:2:2556).

The gas boats listed were known commonly in the region as "Putt Putts" because of the sound their gasoline-powered engines made. These single and double cylinder engines were developed by Lockwood Ash near the turn of the century. The Natler company, which later became Evinrude, sold the engines to area trappers and fishermen through the Plaquemine market. Sears & Roebuck also carried the 6hp and 8hp engines, which they sold under the "Motorgo" name. Locals adapted their bateaux to hold the engine, which actually was the same hand-cranked, spark plug and coil system as that installed in a Ford Model-T automobile (LPBVD 1998).

During the early twentieth century, freight carried on the Vermilion River consisted principally of sugar cane, rice, cotton, and miscellaneous merchandise. In 1901, sugar cane comprised 41.4 per cent of the total freight; but, by 1916, that figure had nearly doubled to 82.6 per cent of the total freight carried. Shipment of cane required vessels with a 4 ft draft. Rice, which comprised about 9.8 percent of the tonnage in 1916, required vessels with a draft of between 3 ft and 3 ft 6 in. Table 5 charts the tonnage, value, and haul distance of selected freight shipped on the Vermilion River after early dredging operations opened up the channel. Besides the listed articles, cargo items also included livestock, refined sugar, molasses, various farm and dairy products, feed, fertilizers, and fuel oil (COE 1912:2:1981; 1917:1:930-932, 2:2256).

On February 19, 1924, the *Lillian*, an Abbéville-based vessel of unrecorded type or dimensions, burned on the Vermilion River in the vicinity of Lafayette, apparently near the Pinhook Bridge (Clune and Wheeler 1991). That wreck apparently remains submerged in the area. Several years prior to the loss of the *Lillian*, a barge wreck was removed in 1915 by the U.S. Army Corps of Engineers from the Vermilion channel. The precise location of the sunken barge was not noted; however, the wreck reportedly was situated somewhere between the mouth of the Vermilion and RM 41, which falls near the entrance of the waterway into Vermilion Parish at the Lafayette Parish line and within the lower portion of the project corridor (Pearson et al. 1989:237).

Table 5. Selected items of commercial freight shipped on the Vermilion River, or Bayou Vermilion, in 1911 and 1916 (Chief of Engineers 1912:2:1981; 1917:2:2556).

Commercial Freight	Short Tons Shipped, 1911	Value, 1911	Average Miles Hauled, 1911	Short Tons Shipped, 1916	Value, 1916	Average Miles Hauled, 1916
Sugar cane	24,000	$108,000	25	27,077	$108,308	16
Cotton	275	$55,000	25	318	$63,600	35
Cotton seed	33	$990	25	323	$9.690	35
Rice	80	$3,200	30	3,222	$257,760	25
Potatoes	22	$880	25	30	$1,500	40
Oysters	20	$500	60	110	$2,750	60
Furs and hides	65	$14,375	60	17	$3,898	40
Coal	450	$2,700	60	126	$504	40
Lumber	500	$5,000	25	386	$4,825	30
Shingles	18	$450	25	16	$400	30
Brick	180	$720	25	6	$18	25
Iron and steel	30	$3,000	15	41	$2,460	40

With no levees along the Vermilion River/Bayou, the area depended for its flood protection on the Atchafalaya River levee system to the east. The region was deluged during the great flood of 1927; however, the district did not suffer as much devastation as did areas closer to the Atchafalaya and Mississippi Rivers (Griffin 1959:153-167). Still, as mentioned earlier in this chapter, the Lafayette railroad bridge was destroyed and riverside properties such as the Baldwin (or Texas) Lumber Company were submerged (Figure 24). The Pinhook Bridge also was washed away during the May flood (Figure 30). Over a decade later, in mid-August of 1940, hurricane rainfall precipitated another serious flood in Lafayette and Vermilion Parish. The Vermilion River registered 19.6 ft above sea level, its highest stage ever in Lafayette Parish, and in Vermilion Parish, the flood elevation reached 25.7 ft above sea level at Maurice, near the lower end of the project corridor (LPDB 1953:47; VPDB ca. 1965:29-30, 34).

By 1926, no sailing vessels were reported as freight carriers on the Vermilion waterway. Over the next several years, the number of steamers declined, while the number of motor craft and barges increased significantly. In 1926, cargo on the Vermilion consisted chiefly of sugar cane, refined sugar, rice, and fuel oil. By the mid-1930s, petroleum products constituted the principal freight tonnage on the river, followed by crude sulphur [sulfur], sugar cane, and rice (COE 1927:1:893, 2:512-513; Pearson et al. 1989:237, 240-241).

Use of the Vermilion River as a transportation and shipping route declined drastically during the mid-twentieth century. Waterborne travel and commerce simply could not compete with the railroads and the paved road system, the latter of which was finished during the late 1930s. In 1944, federal engineers again began dredging the Vermilion River from its mouth to a point above the rebuilt Pinhook Bridge in order to improve navigation on the stream. They dredged the waterway to a depth of 9 ft and a width of 100

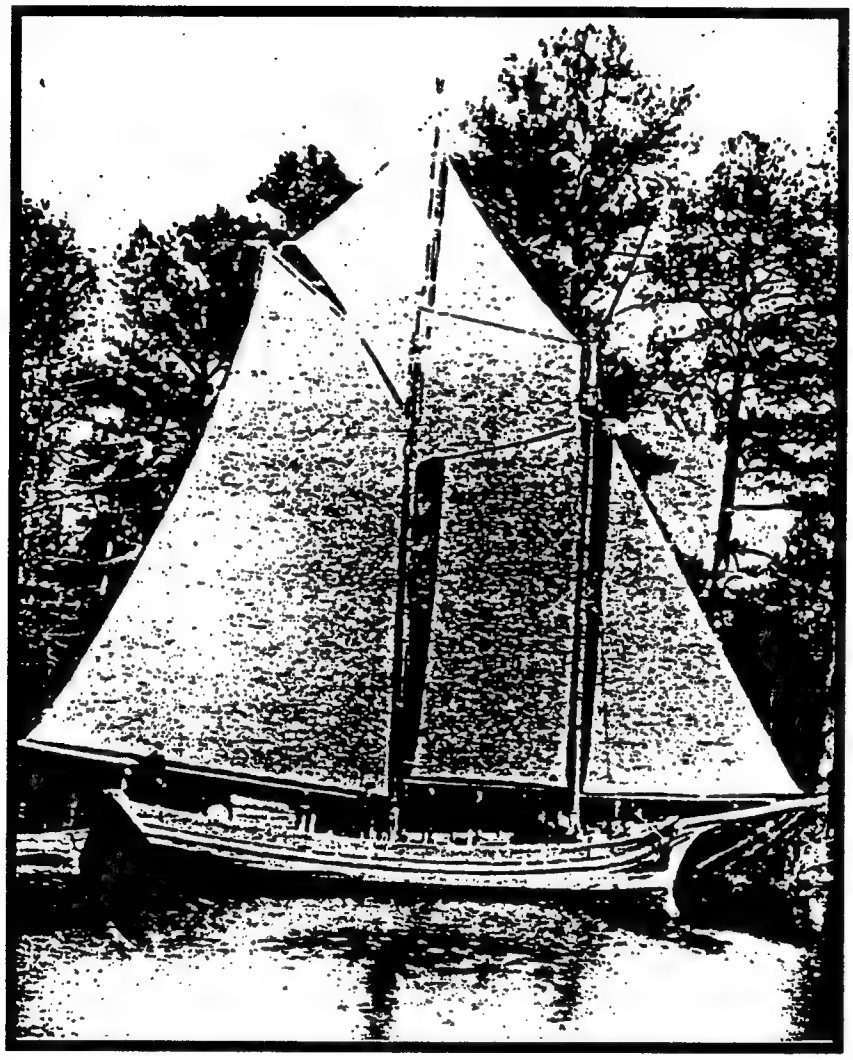

Figure 29. Small schooner used throughout Louisiana's bay and bayous to carry goods and for fishing (Coastal Environments, Inc.1991:40)

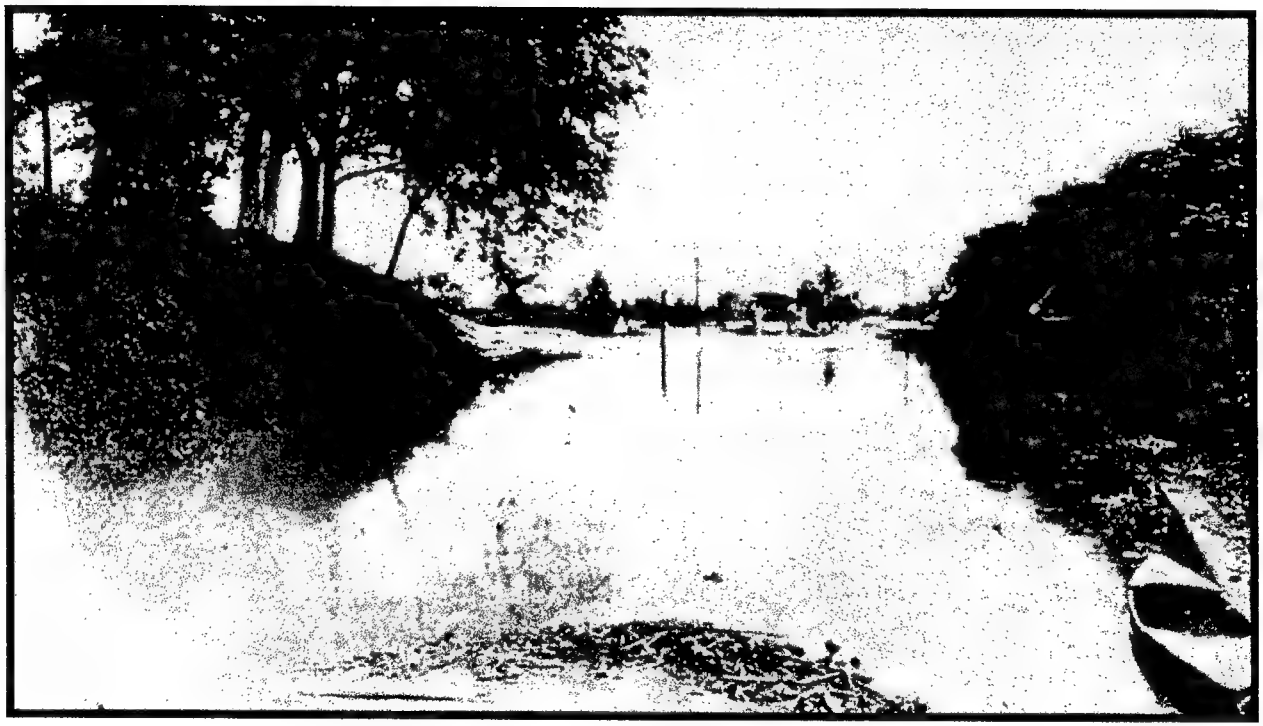

Figure 30. Photograph of the "Pin Hook [sic] Bridge near Lafayette swept away" during the flood of 1927 (Griffin 1959: facing index)

- 125 ft (Griffin 1959:90-91; LPBVD n.d.). Although barge and light boat traffic was noted during the 1950s, a survey of Lafayette Parish in 1953 reported that no regularly scheduled lines plied the river: "Only traffic is for B & B Towing Co., an occasional barge of pipe, gravel or sand" (Lafayette Parish Development Board 1953:97).

The petroleum boom brought another sort of commercial traffic to the Vermilion River/Bayou during the twentieth century. By 1947, the United Gas Pipeline Company had constructed an 8-in natural gas pipeline across the waterway near Milton, at the lower end of the project corridor, and another 8-in line upstream, midway on the Vermilion's course through Lafayette Parish (Louisiana Geological Survey [LGS] 1947). Over the next 12 years, other companies joined United Gas in the construction of natural gas pipelines across the project corridor segment of the Vermilion, including Gulf Interstate Gas Company, Louisiana Intrastate Gas Corporation, and Texas Gas Transmission Corporation (LGS 1959). Today, although the oil and gas business generally has declined in the region, the Vermilion is crossed by a number of natural gas pipelines, including several along the project corridor. The principal lines are operated by United Gas Pipeline Company, Trans-Louisiana, Texas Gas Transmission Company, Columbia Gulf Transmission Company, Louisiana Intrastate Gas, Conoco, and Norcen. In addition, Shell has placed a 12-in ethylene pipeline across the lower end of the project corridor above Milton (DTC Cartographic Services 1992a, 1992b).

Water pollution has presented an increasing threat along the project corridor as the nearby population has expanded. The Vermilion always has been a sluggish stream, and downstream flow diminishes in the vicinity of Lafayette. In the late Summer and early Fall, the river virtually stagnates. During such periods, flow can move either upstream or downstream. According to a study undertaken in 1980, "When flow lessened, waste inputs from the urban area degraded the water quality in the stagnant reach downstream from Lafayette, primarily through accumulations of nutrients, organic carbon, and biochemical oxygen demand" (Demchek and Leone 1983:1). In the meantime, industrialization, urbanization, and agriculture impose increasing demands upon the river, not only in the late Summer, but year round.

In 1984, the Lafayette Parish Bayou Vermilion District (LPBVD) was created to help address the problems of pollution and litter and to promote the cultural and recreational aspects of the Vermilion waterway. Among the projects sponsored by this organization are volunteer trash pick-ups. In recent years, refuse found in Bayou Vermilion has included tires, refrigerators, cash registers, and a 1989 Mazarati automobile. More typically, carelessly discarded litter falls into the waterway and catches on the fallen tree limbs that still choke the channel despite all previous snagging efforts (LPBVD ca. 1997).

Summary

The project corridor extends along a section of the Vermilion River, that historically served as the principal route for transport and commerce for the residents of that region. Despite the persistent navigation problems presented by snags and debris, cleared portions of the waterway were used whenever possible. Until the advent of railways and paved roads through the area, waterborne transport was faster and more economical than overland shipping and travel. Although it no longer is a commercial transportation artery, the Vermilion waterway, nevertheless, was an important factor in the economic development of the parish and city of Lafayette, and of the adjoining St. Martin and Vermilion Parishes.

The Vermilion River Valley has been occupied continuously since the last quarter of the eighteenth century, with the most intensive development occurring during the nineteenth century. Potential historic resources within the project area could encompass a wide variety of types, including the remains of wrecked and abandoned vessels and/or their cargoes; bridge supports and abutments; wharf facilities associated

with early agricultural complexes along the river, and with nineteenth and twentieth century industrial and transportation activities; and, possibly, near-shore debris fields related to domestic and commercial complexes that formerly stood along the river shoreline.

The extent to which these resources might have survived intact within the project corridor is problematic, given the relatively sporadic, albeit consistent, dredging and obstruction removal that occurred beginning in the closing years of the nineteenth century. These navigation improvement efforts not only deepened the river channel, but also involved widening the channel and removing snags and one or more wrecks within the project corridor. Further disturbance of the river bottom and shorelines would have accompanied the mid-twentieth century installation of petrochemical pipelines across the river bed. Moreover, the effects of massive flooding, as in the 1927 storm, would have scoured both the river channel and its shorelines. As a result, it is probable that many historic archeological resources have been destroyed.

The potential for recovering significant, intact historic archeological remains within the project corridor is assessed as low.

CHAPTER IV

PREVIOUS INVESTIGATIONS

Introduction

This chapter presents an overview of previous archeological research completed within the vicinity of the Vermilion River Remote Sensing Survey (RSS) project area situated in portions of Lafayette, St. Martin, and Vermilion parishes, Louisiana. This discussion provides the comparative data necessary for assessing the results of the current cultural resources inventory. In addition, it ensures that the potential impacts to all previously recorded cultural resources located within the general vicinity of the currently proposed project corridor are taken into consideration.

The information contained in this review was based on a background search of data currently on file at the Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, Divisions of Archaeology and Historic Preservation, in Baton Rouge.

The chapter is divided into four sections. The first contains a review of previous cultural resources surveys completed within 3.2 km (2 mi) of the proposed Vermilion River RSS project item. The second section presents a review of previously recorded archeological sites located within 1.6 km (1 mi) of this study area. A description of National Register of Historic Places listed properties located within 1.6 km (1 mi) of the project parcel is presented next. The last section contains a review of *A Database of Louisiana Shipwrecks* (Clune and Wheeler 1991).

Previously Conducted Cultural Resources Surveys within 3.2 km (2 mi) of the Proposed Vermilion River RSS Project Area

A total of 24 previously completed cultural resources surveys and archeological inventories have been conducted within 3.2 km (2 mi) of the proposed Vermilion River RSS project area (Table 6). These investigations resulted in the identification of over 160 archeological sites and 468 standing structures. While 43 previously recorded sites (16LY1 – 16LY3, 16LY5, 16LY6, 16LY8, 18LY10, 16LY12, 16LY13, 16LY22, 16LY24 – 16LY26, 16LY28 – 16LY30, 16LY44, 16LY46, 16LY50, 16LY52, 16LY55, 16LY56, 16LY58, 16LY59, 16LY61 – 16LY63, 16LY65, 16LY67, 16LY68, 16LY72, 16LY73, 16LY76 – 16LY78, 16LY80, 16LY96, 16LY99, 16SM15, 16SM18, 16SM20, 16SM81, and 16VM126) are located within 1.6 km (1 mi) of the currently proposed project area, none are situated within the currently proposed Area of Potential Effect. The 24 surveys that have been conducted are reviewed here in chronological order, and organized according to the parish in which they were conducted. Surveys incorporating more than one parish are discussed at the end of the section.

Lafayette Parish. On October 2, 1975, the State of Louisiana, Department of Highways, Baton Rouge, conducted a Phase I cultural resources survey and archeological inventory of the proposed Pinhook Road Vermilion River Bridge and Approaches

Table 6. Previous Archeological Investigations Completed Within 3.2 km (2 mi) of the Proposed Vermilion River RSS Project Area

Survey Date	Report Number	Title/Author	Field Methodology	Results
Lafayette Parish				
1975	22-259	Letter report. Subject: Cultural Resources Survey of Vermilion River Bridge and Approaches at Pinhook Road (Route LA 182), Lafayette Parish, Louisiana (Rivet 1975)	Records review and an unspecified type of field survey	No cultural resources were identified; no additional testing was recommended.
1975	22-5	*Archaeological Survey of the Lafayette Municipal Airport, Lafayette, Louisiana* (Gibson 1976)	Records review and pedestrian survey	Identified and/or relocated Sites 16LY5, 16LY6, 16LY10, 16LY12, 16LY13, 16LY25, 16LY28, 16LY30, 16LY61, 16LY62, and 16SM13. Of these, Sites 16LY6, 16LY12, 16LY28, 16LY30, and 16LY61 were assessed as potentially significant and additional testing was recommended.
1978	22-1429	*Hotard Airport West: Determination of Significance and Evaluation of Adverse Impact* (Gibson 1978)	Pedestrian survey and the examination of an escarpment profile	No cultural resources or features were identified during additional testing of the Hotard Airport West Sites (16LY28). The site was assessed as not significant and no additional testing was recommended.
1979	22-496	*Archeological Survey, Four Laning of Kaliste Saloom Road Extension* (OCES Corporation 1979)	Records review, pedestrian survey, and shovel testing	No cultural resources were identified; no additional testing was recommended.
1980	22-819	*Cultural Resources Survey, South College Road Extension, Pinhook Road – Kaliste Saloom Road, Lafayette Parish* (Coastal Environments, Inc. 1982)	Records review, vehicular survey, pedestrian survey, and shovel testing	Identified Sites 16LY56 and 16LY58. In addition, previously recorded Site 16LY55 was relocated and isolated finds X16LY-C and X16LY-D were noted. Sites 16LY56and 16LY58 were assessed as potentially significant. Additional testing of Site 16LY58 was recommended while no additional testing was recommended at Site 16LY56 as it was situated beyond the Area of Potential Effect. The remaining site (16LY55) and the two isolated finds were assessed as not significant and no additional testing was recommended.
1986	22-1167	*A Cultural Resources Survey of Three Proposed Vermilion River Bridge Alignments in Lafayette Parish, Louisiana* (Whelan and Castille 1988)	Records review, pedestrian survey, and shovel testing	Identified Sites 16LY59 and 16LY60. Site 16LY60 was assessed as not significant and no additional testing was recommended. Site 16LY59 was not assessed; however, additional testing of the site was recommended.
1986	22-1152	*Cultural Resources Survey of River Oaks Flood Protection Project, Phase II, Lafayette, Louisiana* (Gibson 1986)	Records review, pedestrian survey, and subsurface probing	No cultural resources were identified; no additional testing was recommended.
1989	22-1385	*A Cultural Resources Survey of a Portion of Beaver Park, Lafayette Parish, Louisiana* (Hahn III 1991)	Records review, pedestrian survey, and auger testing	A total of 19 historic period artifacts, 11 *Rangia cuneata* shells, 1 oyster shell, and 5 unmodified pebbles were recovered during auger testing; however, no site number was assigned and no additional testing of the proposed project area was recommended.

Survey Date	Report Number	Title/Author	Field Methodology	Results
1991	22-1557	*Where the River and the Ridge Meet: Cultural Resources Investigations along the I-49 Connector, Lafayette, Louisiana* (Gibson 1991)	Records review, pedestrian survey, shovel testing, and soil probing	No archeological sites were identified; however, a total of 436 standing structures which appeared to be greater than 50 years in age were noted. Of these, 252 structures were assessed as potentially significant, while a total of 112 structures were reportedly eligible for listing on the National Register. Additional recordation of these 364 structures was recommended.
1995	22-1957	*Phase I Cultural Resources Assessment for the Proposed New Federal Courthouse, Lafayette, Louisiana* (Largent and Green 1996)	Records review and pedestrian survey	Identified 20 standing structures within the proposed project area. Of these, 13 structures were assessed as potentially significant; however, 11 of these would not be adversely impacted by proposed construction and no additional recordation was recommended. The remaining two structures (situated at 816 and 822 Lafayette Street) reportedly would be destroyed during proposed construction. Additional recordation of these two structures was recommended.
1996	22-1969	*Phase I Archaeological Investigation of the Proposed New Federal Courthouse Lafayette, Louisiana* (Servello and Patterson 1996)	Records review, pedestrian survey, shovel testing, and unit excavation	Identified Site 16LY79 within the proposed construction area. The site was assessed as not significant and no additional testing was recommended.
1996	22-1927	*Beyond the River and the Ridge: Cultural Resources Investigations of Ambassador Caffery Parkway, Lafayette Parish, South-Central Louisiana* (Gibson et al. 1996)	Records review, pedestrian survey, and shovel testing	Identified a scatter of historic period artifacts; however, no site number was assigned. In addition, seven standing structures were noted. The historic period locus and the seven standing structures were assessed as not significant and no additional testing/recordation was recommended.
1997	22-1927 Addendum	*Addendum to Beyond the River and the Ridge: Cultural Resources Investigations of Ambassador Caffery Parkway, Lafayette Parish, South-Central Louisiana, Alternates C, D, G, K, and L* (Gibson and Brasseaux 1997)	Records review, pedestrian survey, and shovel testing	Identified historic period Site 16LY81 as well as an historic period isolated for which no site number was assigned. Both of these cultural resources were assessed as not significant and no additional testing was recommended.
1997 – 1998	22-2173	*Cultural Resource Investigations of the Proposed River Ranch Development, Lafayette Parish, Louisiana* (Ryan and Coxe 1998)	Records review, pedestrian survey, and shovel testing	Relocated previously recorded Site 16LY59 and identified two standing structures. Site 16LY59 was assessed as not significant and no additional testing was recommended. Both standing structures also were assessed as not significant. No additional recordation of these structures was recommended.
1998	22-2242	*Phase I Cultural Resources Survey and Inventory of the Proposed Vermilion River Dredge Maintenance Project, Lafayette Parish, Louisiana* (Lichtenberger et al. 1999)	Records review, pedestrian survey, shovel testing, auger testing, probing, magnetometer survey, and a marine remote sensing survey	Identified Sites 16LY94, 16LY95, and 16LY97 as well as two non-site loci (4-1 and 5-1) and one standing structure (SS1). All of these cultural resources were assessed as not significant and no additional testing was recommended; however, it was recommended that Site 16LY97 (Picard Cemetery) be avoided. In addition, a marine remote sensing survey identified 31 anomalies; however, none of these were believed to represent cultural resources and no additional testing of these anomalies was recommended.

Survey Date	Report Number	Title/Author	Field Methodology	Results
1999	22-2272	*Cultural Resources Survey of a Proposed Construction Area along the Vermilion River, Lafayette Parish, Louisiana* (Roberts 2000)	Records review, pedestrian survey, and auger testing	Identified Site 16LY99 as well as relocating previously recorded Site 16LY55. Both sites were assessed as potentially significant and additional testing was recommended.
Multiple Parishes				
1974 and 1976	22-119	*Supplement to Environment Effect Assessment of the Lafayette Loop [State Project 700-07-96 (21)]* (Gulf South Research Institute 1976)	Records review and pedestrian survey	Identified and/or relocated Sites 16LY11, 16LY24, 16LY27, 16LY32 – 16LY54, 16LY57, 16LY70 – 16LY78, 16SM15, 16SM18, 16SM24, and 16SM82. While none of the sites were specifically assessed, various degrees of additional testing was recommended at Sites 16LY11, 16LY24, 16LY27, 16LY32 – 16LY37, 16LY39 – 16LY53, 16LY57, 16LY70 – 16LY73, and 16LY76 – 16LY78. No additional testing was recommended for the remaining sites.
1975	22-105	*Archeological Survey of Bayou Teche, Vermilion River, and Freshwater Bayou, South Central Louisiana* (Gibson 1975)	Records review, pedestrian survey, bankline survey, and limited subsurface testing utilizing a trowel	Identified and/or relocated Sites 16LY5 - 16LY7, 16LY10, 16LY12 - 16LY14, 16LY17, 16LY22 – 16LY26, 16LY28, 16LY29, 16LY55, 16LY61 – 16LY63, 16SM15, 16SM17, 16SM20, 16VM104, 16VM126, and 16VM127. An additional 13 identified sites were discussed using the number assigned by the University of Southwestern Louisiana (USL Sites 16IB2, 16SL2, 16SL31, 16SM6, 16SM13, 16SM18, 16SM20, 16SM21, 16SM24 – 16SM26, 16VM11, and 16VM17); however, the corresponding official state site numbers were not noted. While none of these sites was specifically assessed, avoidance or additional testing of Sites 16LY5 – 16LY7, 16LY14, 16LY17, 16LY23, 16LY61, 16SM15, 16SM17, 16SM20, 16VM126, USM 16IB2, USM 16SL2, USM 16SM13, USM 16SM24, USM 16VM11, and USM 16VM17 was recommended. In addition, archeological monitoring of the remaining sites during proposed construction was recommended.
1978	22-366	*The Texas-Louisiana Ethylene (TLP) Project* (McIntire 1978)	Records review, helicopter survey, boat survey, vehicular survey, pedestrian survey, shovel testing, and auger testing	Within Louisiana, Site 16AC21 was identified within the proposed corridor; however, the site is not situated within the vicinity of the current project area.
1986	22-1120	*A Cultural Resources Survey of Coulee Ile des Cannes, Lafayette Parish, Louisiana* (Whelan 1986)	Records review, pedestrian survey, and shovel testing	Relocated previously recorded Sites 16LY1, 16LY51, and 16VN7. None of these sites were assessed by the author and no additional testing of the three sites, or of the proposed project area, was recommended.

Survey Date	Report Number	Title/Author	Field Methodology	Results
ca. 1991	22-1681	*Archaeological Atlas and Report of Prehistoric Indian Mounds in Louisiana, Vol. VI, Arcadia, Lafayette, & St. Landry Parishes* (Jones and Shuman 1991)	Records review and pedestrian survey	Identified prehistoric period mound Sites 16SL111 – 16SL115. In addition, previously recorded prehistoric period mound Sites 16AC1, 16AC3, 16LY1, 16LY2, 16LY7, 16LY10, 16LY55, 16SL1 – 16SL3, 16SL6, 16SL8 - 16SL10, 16SL11, 16SL14, 16SL18, 16SL20, 16SL25, 16SL27, 16SL31 - 16SL34, 16SL36, 16SL41, 16SL94, 16SL96, 16SL97, 16SL109 were reinvestigated. None of these sites were specifically assessed and no recommendations concerning additional testing were reported.
1995	22-1926	*A Cultural Resources Survey from Sorrento, Louisiana to Mount Belvieu, Texas* (Skinner et al. 1995)	Records review, pedestrian survey, vehicular survey, and shovel testing	No cultural resources were identified; no additional testing was recommended.
1997 – 1998	22-2203	*Phase I Cultural Resources Survey and Archeological Inventory of the Proposed Tends Breaux Bridge System Pipeline Project, Vermilion, Lafayette, and St. Martin Parishes, Louisiana* (Robblee et al. 1999)	Records review, vehicular survey, pedestrian survey, and shovel testing	Identified Sites 16VM148 – 16VM151 and 16LY82 – 16LY93 as well as four non-site loci (V02-02, V07-01, V07-02, and LAF10-01) and four standing structures (22-1 – 22-4). Of these, only Site 16LY87 was assessed as potentially significant; however, it was reportedly located beyond the Area of Potential Effect and no additional testing of the site was recommended. The remaining 16 archeological sites, four non-site loci, and four standing structures were assessed as not significant and no additional testing was recommended.
1998	22-2171	*Archeological Phase I Survey of Eight 90th Regional Support Command Facilities in Louisiana* (Parsons Engineering Science, Inc. 1998)	Records review, pedestrian survey, and shovel testing	Within the vicinity of the current project area, a single site (16LY96) was identified. Site 16LY96 was assessed as not significant and no additional testing was recommended.

project area (Rivet 1975). The survey was designed to identify all cultural resources located near the Vermilion River Bridge and its approaches along Pinhook Road (Highway 182). Despite an intensive visual reconnaissance, no cultural resources were identified during survey. No additional testing of the proposed project corridor was recommended.

Jon Gibson conducted a Phase I cultural resources survey and archeological inventory during December of 1975 of the Lafayette Municipal Airport prior to the start of a proposed expansion project (Gibson 1976), on behalf of Domingue, Szabo, and Associates, Inc. Fieldwork consisted of pedestrian survey throughout the entire area of potential effect; however, the overall size of the area subjected to survey was not reported. Gibson (1976) stated that a total of 11 previously known and/or newly recorded sites (16LY5, 16LY6, 16LY10, 16LY12, 16LY13, 16LY25, 16LY28, 16LY30, 16LY61, 16LY62, and 16SM13) were examined within the project area. Of these 11 sites, only one (Site 16LY62) contained both prehistoric and historic period components; the remaining 10 sites were described as prehistoric in nature. The cultural composition of these sites included evidence of Archaic, Poverty Point, Tchefuncte, Marksville, Issaquena, Troyville/Coles Creek, and Plaquemine period cultural activities. Despite previous mechanical impacts, Gibson (1976) assessed five sites (16LY6, 16LY12, 16LY28, 16LY30, and 16LY61) as potentially significant resources, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]), and he recommended either avoidance or additional evaluatory testing at these sites. Gibson (1976) also offered suggestions for the development of a comprehensive testing regime that could be implemented in conjunction with a five-year development plan for the airport. Of these sites, a total of 10 (Sites 16LY5, 16LY6, 16LY10, 16LY12, 16LY13, 16LY25, 16LY28, 16LY30, 16LY61, and 16LY62) are located within 1.6 km (1 mi) of the currently proposed project area. These 10 sites are discussed in greater detail below.

During August 1978, Jon Gibson performed archeological testing at previously recorded Site 16LY28 on behalf of Domingue, Szabo, and Associates, Inc. of Lafayette, Louisiana, at the request of the Lafayette Airport Commission (Gibson 1978). The testing was conducted in anticipation of the proposed construction of a minimum security prison by the Lafayette Parish Police Jury; the project area was located on property encompassed by the Lafayette Regional Airport, and held under the jurisdiction of the Federal Aviation Administration. Site 16LY28 was described as a Troyville/Coles Creek component identified by Gibson (1975) during the previously discussed survey. At that time, Gibson assessed the site as potentially significant, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]), and he recommended either avoidance or additional evaluatory testing. Despite this evaluation, approximately 0.6 m (2 ft) of soil had been removed from Site 16LY28 during mechanical landscaping activities that apparently were associated with the construction of an additional runway pad.

Gibson (1978) noted that archeological testing of the site included intensive pedestrian survey augmented by the random excavation of an unspecified number of "small trowel holes." No artifacts or cultural features were identified at the site, and Gibson (1978) determined that Site 16LY28 had been destroyed by the earthmoving activities. As a consequence, Site 16LY28 was assessed as not significant, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]), and no further work was recommended. Site 16LY28 is situated within 1.6 km (1 mi) of the currently proposed project area and is discussed below.

In 1979, OECS Corporation of Lafayette, Louisiana, conducted a Phase I cultural resources survey and archeological inventory of the proposed Kaliste Saloom Road extension prior to proposed widening of the roadway (OECS Corporation 1979). The

survey was conducted on behalf of the Department of Public Works of the City of Lafayette, Louisiana. The proposed project corridor measured 1,371.6 m (4,500 ft) in length; however, the width of the corridor was not reported. Pedestrian survey, augmented by shovel test excavation within all wooded lots (presumably where the ground surface was obscured), failed to identify any cultural resources. No additional work was recommended.

During May and June of 1980, Coastal Environments, Inc. and D. Ralph Caffery & Associates, Inc. conducted Phase I cultural resources survey and archeological inventory of the proposed South College Road extension for the Department of Public Works of the City of Lafayette (Coastal Environments, Inc. 1982). The length and width of the proposed road extension was not reported; however, the proposed expansion was labeled "Zone I." A second, poorly defined area (termed "Zone II") also was examined in anticipation of future development. Survey methods for both project areas consisted of vehicular and pedestrian survey; in Zone I, this testing strategy was augmented by the excavation of an unspecified number of systematic shovel tests. Two archeological sites (16LY56 and 16LY58) and two isolated loci (X16LY-C and X16LY-D) were identified during the survey of Zone I; a previously recorded site (16LY55) also was relocated. Coastal Environments, Inc. (1982) noted that an unspecified number of isolated, historic/modern period artifacts were observed in Zone II, but these loci were not given field designations.

The first of the two isolates (Locus X16LY-C) consisted of 4 sherds of pearlware that originated from the same vessel; the second isolate (X16LY-D) contained only a single projectile point fragment with an unknown cultural/temporal affiliation. Each of these loci was assessed as not significant, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]). Of the three identified archeological sites, one (Site 16LY55) dated from the prehistoric (Tchefuncte and/or Marksville) period, while the remainder (Sites 16LY56 and 16LY58) were described as historic. Only two sites (16LY55 and 16LY58) were evaluated as potentially significant cultural resources, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]), and each of these sites was recommended for additional evaluatory testing. Site 16LY56 was assessed as not significant.

Although it reportedly would not be impacted under the proposed alignment plan, "Level II" testing was conducted at Site 16LY55. The excavation of four backhoe trenches at the site failed to identify any features or evidence of intact cultural deposits, and Site 16LY55 eventually was evaluated as not significant under the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]). Level II testing at Site 16LY58, a scatter of mid-eighteenth to early nineteenth century materials, included the excavation of one 2 x 2 m (6.6 x 6.6 ft) test unit and three 1 x 1 m (3.3 x 3.3 ft) test units. While these investigations resulted in an assessment of not significant applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]), archeological monitoring of the site was recommended during the initial grading and construction activities associated with the road expansion. Sites 16LY55, 16LY56, and 16LY58 are situated within 1.6 km (1 mi) of the proposed project area, and they are discussed in greater detail below.

Coastal Environments, Inc. conducted Phase I cultural resources survey and archeological inventory during March of 1986 of three proposed bridge construction sites crossing the Vermilion River within the City of Lafayette (Whelan and Castille 1988). The survey, which was completed at the request of PENSCO of Lafayette, Louisiana, encompassed a parcel of 14.2 ha (35 ac). Pedestrian survey augmented by shovel testing resulted in the identification of archeological Sites 16LY59 and 16LY60.

Site 16LY59 was described as a surface scatter of historic period artifacts that dated from the late nineteenth to early twentieth centuries, while Site 16LY60 consisted of a

single Baytown Plain, *var. unspecified* prehistoric period ceramic sherd that was recovered from the ground surface. Of these two sites, Site 16LY60 was assessed as not significant, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]), and no additional testing was recommended. The remaining site (16LY59) was not evaluated, but additional testing of the site was recommended. Of these two archeological sites, only one (Site 16LY59) is situated within 1.6 km (1 mi) of the currently proposed project area, and it is discussed in the section on sites below.

In May 1986, Archaeology Inc., of Lafayette, Louisiana, completed a Phase I cultural resources survey and archeological inventory of the proposed River Oaks Flood Protection Project at the request of Domingue, Szabo, and Associates, Inc. (Gibson 1986). The project area measured approximately 20 x 300 m (65.6 x 984 ft) in size and was situated between River Road and the western bank of the Vermilion River. Pedestrian survey augmented by the excavation of an unspecified number of soil corings failed to identify any cultural resources. No additional testing of the proposed project area was recommended.

During January 1989, Coastal Environments, Inc. completed Phase I cultural resources survey and archeological inventory of a 2.8 ha (6.8 ac) parcel within Beaver Park, Lafayette Parish; the tract represented the proposed site of the planned Acadian Culture Center (Hahn 1991). Survey of the project area was conducted on behalf of Hamilton and Associates of Opelousas, Louisiana, and Jean Lafitte National Historical Park and Preserve in New Orleans. A pedestrian survey was conducted along transects spaced 20 m (65.6 ft) apart within the flood plain and on transects spaced 5 m (16.4 ft) apart on the adjacent bluffs. In addition, a total of 241 auger tests were excavated within the project area; these produced a total of 36 artifacts. Hahn (1991) stated that all of these artifacts originated from disturbed contexts, and that the stratigraphic profiles demonstrated that the landscape had been altered and heavily impacted by a combination of unspecified mechanical and natural processes. A majority of the artifacts reportedly were related to modern activities associated with the park, and only two artifacts were identified as historic/modern period whiteware sherds. No loci or archeological sites were recorded, and no additional testing of the tract was recommended.

Between February and April of 1991, Jon Gibson completed Phase I cultural resources survey and archeological inventory of the proposed Lafayette Interstate 49 Connector Project corridor on behalf of Howard, Needles, Tammen, & Bergendoff, Inc. of Baton Rouge, Louisiana, and the State of Louisiana, Department of Transportation and Development (Gibson 1991). The project corridor measured approximately 800 m (2,624.7 ft) in width by 8.9 km (5.5 mi) in length. The proposed right-of-way was situated adjacent to U.S. Highways 167 and 90, and it extended southward from Ponte de Moutom Road to the Lafayette Regional Airport. Although most of this corridor crossed urban areas within the City of Lafayette and was not conducive to shovel testing, three areas (the Le Rosen School, the south bank of the Vermilion River west of the Evangeline Thruway, and several square blocks within the Sterling Grove Historic District) were identified as having the potential to contain buried intact historical deposits. Within these areas, Gibson (1991) recommended either avoidance or an intensive survey/recovery prior to road construction. In addition, the Vermilion River portion of the project area was identified as exhibiting a high probability for prehistoric cultural resources. This portion of the survey area included a 1,500 m (4,921.3 ft) long section of the Vermilion River between the southern edge of U.S. Highway 90 and the "new" University Avenue bridge. Fieldwork in this area consisted of pedestrian survey augmented by the excavation of shovel tests at 30 m (98.4 ft) intervals along each bank of the river. No cultural resources loci were identified along the Vermilion River, and no additional testing of this portion of the right-of-way corridor was recommended.

In addition to the archeological survey, an architectural survey was undertaken to identify all built properties older than 50 years. A total of 436 previously unexamined historic period standing structures were identified as a result of this undertaking; 72 of these were assessed as not significant applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]). The 364 remaining structures were assessed as either potentially significant or significant cultural properties that potentially were eligible for listing in the National Register of Historic Places. No state standing structure numbers were requested for these structures as a result of the survey.

Geo-Marine, Inc. of Plano, Texas, conducted an architectural evaluation during August and September of 1995 of a 3 ha (7.4 ac) parcel in the City of Lafayette prior to proposed construction of a new Federal courthouse (Largent and Green 1996). The survey was completed on behalf of the General Services Administration, Public Buildings Service, Fort Worth, Texas. Following a literature review, a photographic and architectural survey of the proposed building site was conducted. Largent and Green (1996) stated that this survey resulted in the identification of 20 standing structures within the Area of Potential Effect; however, no standing structure numbers were assigned.

Of the 20 standing structures, 13 were assessed as potentially significant, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]); however, the study found that only two (816 and 822 Lafayette Street) would suffer adverse impacts as a result of the proposed construction. Additional recordation of these two structures was recommended. The remaining seven structures that were identified within the Area of Potential Effect were assessed as not significant, and no additional recordation was recommended. Because the 11 remaining potentially significant standing structures would not be impacted adversely, no additional recordation was recommended. None of the 20 standing structures identified during this survey are situated within 1.6 km (1 mi) of the currently proposed project area.

During July of 1996, the U.S. Army Corps of Engineers, Fort Worth District, subsequently completed a Phase I cultural resources survey and archeological inventory of the same 3 ha (7.4 ac) parcel prior to proposed construction of the Federal courthouse building (Servello and Patterson 1996). Servello and Patterson (1996) reported that pedestrian survey augmented by shovel testing and the excavation of a single 1 x 1 m (3.3 x 3.3 ft) test unit resulted in the identification of Site 16LY79.

Site 16LY79 was described as a scatter of historic period artifacts that dated from the 1800s to the present. The site measured 3 ha (7.4 ac) in size and included the entire proposed construction site location. Servello and Patterson (1996) stated that Site 16LY79 had been disturbed previously, and thus it was assessed as not significant, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]). No additional testing of Site 16LY79 was recommended. Site 16LY79 is not situated within 1.6 km (1 mi) of the currently proposed project area.

During 1995, Gibson conducted a Phase I cultural resources survey and archeological inventory of three proposed alternate alignments of the Ambassador Caffery Parkway extension corridor located between Louisiana Highway 339 and U.S. 90 in Lafayette Parish (Gibson et al. 1996). The three proposed alignments measured a total of 12.1 km (7.5 mi) in length; the widths of the proposed rights-of-way were not reported. The survey was conducted on behalf of the State of Louisiana, Department of Transportation and Development (LDOTD), Baton Rouge.

Fieldwork included pedestrian survey augmented by the excavation of 102 shovel tests along survey transects spaced approximately 30 m (98.4 ft) apart. No archeological sites were identified, and only one locus (a historic/modern period scatter) was recorded as a result of this inventory; no further testing of this locus was recommended. A total of seven standing structures also were

identified during a windshield survey of the project corridors. None of these was assessed as potentially significant, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]), and no standing structure numbers were assigned. No additional testing of the three proposed highway corridors was recommended.

Sellers & Associates, Inc. of Lafayette, Louisiana subsequently conducted a Phase I cultural resources survey and archeological inventory of five additional proposed highway alignments (C, D, G, K, and L) associated with the Ambassador Caffery Parkway extension project (Gibson and Brasseaux 1997). The survey was completed on behalf of the State of Louisiana, Department of Transportation and Development (LDOTD). The proposed rights-of-way extended from Louisiana Highway 339 to U.S. 90. Gibson and Brasseaux (1996) stated that a total of 27.1 ha (67 ac) were inventoried as a result of this investigation. Fieldwork consisted of pedestrian survey augmented by shovel testing at 30 - 50 m (98.4 - 164 ft) intervals. Only one archeological site (16LY81) and an isolated historic/modern whiteware sherd were identified during survey. Site 16LY81 consisted of a small scatter of historic material that reportedly was associated with a wooden barn. The barn was constructed of wooden pegs and square nails and it apparently dated from the late eighteenth to early nineteenth centuries. Site 16LY81 was assessed as not significant, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]), and no additional testing of the site or of the five proposed highway corridors was recommended. Site 16LY81 is not situated within 1.6 km (1 mi) of the currently proposed project area.

Between December of 1997 and February of 1998, Coastal Environments, Inc. conducted Phase I cultural resources survey and archeological inventory of a 106.8 ha (264 ac) parcel situated within portions of Sections 61 and 62 of Township 10S, Range 4E, Lafayette Parish, prior to proposed residential development of the property (Ryan and Coxe 1998). The survey was conducted at the request of C.H. Fenstermaker & Associates, Inc. of Lafayette. Pedestrian survey augmented by shovel testing resulted in the relocation of previously recorded archeological Site 16LY59, as well as in the identification of two standing structures for which no structure numbers were assigned.

Ryan and Coxe (1996) described Site 16LY59 as a scatter of historic period artifacts that dated from the late nineteenth to early twentieth centuries. They suggested that the site possibly represented the former location of a residential structure. Site 16LY59 was assessed as not significant, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]), and no additional testing of the site was recommended. In addition, Ryan and Coxe (1996) assessed both identified standing structures as not significant, and they recommended no additional recordation of these structures.

R. Christopher Goodwin & Associates, Inc. of New Orleans, Louisiana conducted a Phase I cultural resources survey and archeological inventory during May and June of 1998 of the proposed U.S. Army Corps of Engineers Vermilion River Dredge Maintenance Project area in Lafayette Parish (Athens et al. 1999). That survey, which was completed on behalf of the U.S. Army Corps of Engineers, New Orleans District, included a section of the Vermilion River located between RM 47.5 and 48.4, as well as a 14.2 ha (35 ac) parcel situated within Section 50 of Township 11S, Range 4E.

The marine remote sensing survey of the Vermilion River portion of the proposed project area utilized side scan sonar, recording proton precession magnetometer, and fathometer, and resulted in the identification of 21 magnetic and 10 acoustic anomalies; however, Athens et al. (1999) noted that these anomalies did not include readings consistent with those of submerged cultural resources. The terrestrial portion of the project area was surveyed utilizing a combination of pedestrian survey, shovel testing, magnetometer survey, probing, and auger testing. This testing resulted in the identification of two archeological sites (1LY94 and 1LY95); an historic period cemetery (Site 1LY97); two

non-site loci (4-1 and 5-1); and one historic period standing structure (SS 669).

Athens et al. (1999) described Sites 16LY94 and 16LY95 as historic period artifact scatters, while Site 16LY97 represented the Picard Cemetery. All three cultural resources reportedly dated from the nineteenth to twentieth centuries. Locus 4-1 consisted of an isolated, non-temporally diagnostic prehistoric lithic flake, while Locus 5-1 was described as several brick fragments observed during excavation of a shovel test. Finally, Standing Structure 669 was described as a barn that possibly dated from the early to mid twentieth century. Athens et al. (1999) assessed all of these cultural resources as not significant, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]). While no additional testing of any of these resources was recommended, it was recommended that Site 16LY97 (Picard Cemetery) be avoided. No additional testing of the 21 magnetic and 10 acoustic anomalies identified during the marine remote sensing survey was recommended. None of these cultural resources (Sites 16LY94, 16LY95, 16LY97, Locus 4-1, Locus 5-1, and Standing Structure 669) are situated within 1.6 km (1 mi) of the currently proposed project area.

During June 1999, Coastal Environments, Inc. completed Phase I cultural resources survey and archeological inventory of a parcel adjacent to the west bank of the Vermilion River within the City of Lafayette, which would be impacted by the proposed construction of a flood wall (Roberts 2000). The project parcel measured 823 m (2,700 ft) in length by 15.2 m (50 ft) in width. Pedestrian survey augmented by auger testing resulted in the identification of Site 16LY99 and the relocation of Site 16LY55. This project was undertaken for the U.S. Army Corps of Engineers, New Orleans District.

Roberts (2000) described both sites as prehistoric artifact scatters. Site 16LY55 appeared to represent a late Marksville – early Baytown occupation, while Site 16LY99 dated from early Marksville and Coles Creek periods. Both sites were assessed as potentially significant, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]), and Roberts (2000) recommended that additional testing be completed at each site. Sites 16LY55 and 16LY99 are situated within 1.6 km (1 mi) of the currently proposed project area, and are discussed below in the section on previously recorded sites.

Multiple Parishes. During September 1974 and March 1976, Gulf South Research Institute of Baton Rouge conducted a Phase I cultural resources survey and archeological inventory of three alignments (Original, Alternative 1, and Alternative 2) proposed for the Lafayette Loop highway project within portions of Lafayette and St. Martin parishes (Gulf South Research Institute 1976). Each proposed corridor measured 154.2 m (500 ft) in width; the length of these alignments was not reported. The cultural resources inventory of the proposed project areas was conducted as part of an environmental assessment on behalf of an unreported agency.

A pedestrian survey of the three corridors identified 40 archeological sites (16LY11, 16LY24, 16LY27, 16LY32 - 16LY54, 16LY57, 16LY70 -16LY78, 16SM15, 16SM18, 16SM24, and 16SM82). While none of these sites were assessed specifically applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]), several management recommendations were offered by the contractor. Five sites (16LY38, 16LY44, 16LY74, 16LY75, and 16SM82) were not recommended for additional testing; 23 sites (16LY11, 16LY32 - 16LY37, 16LY39, 16LY40, 16LY42, 16LY43, 16LY45, 16LY46, 16LY49, 16LY53, 16LY57, 16LY70 - 16LY73, 16LY76, 16LY77, and 16LY78) were recommended only for additional archival research; and, nine sites (16LY24, 16LY27, 16LY41, 16LY47, 16LY48, 16LY50 - 15LY52, and 16SM24) were recommended for additional archival research and monitoring during construction. No recommendations were made for the remaining three sites (16LY54, 16SM15 and 16SM18), situated beyond the project's Area of Potential Effect. Twelve of the 40 sites

(16LY24, 16LY44, 16LY46, 16LY50, 16LY52, 16LY72, 16LY73, 16LY76 – 16LY78, 16SM15, and 16SM18) are located within 1.6 km (1 mi) of the proposed project area, and are described below.

In 1975, the University of Southwestern Louisiana in Lafayette conducted a Phase I cultural resources survey and archeological inventory of the banklines of five waterways (Bayou Teche, the Vermilion River, Bayou Fusilier, the Ruth [Evangeline] Canal, and Freshwater Bayou), prior to maintenance work by the U.S. Army Corp of Engineers, New Orleans District (Gibson 1975). Fieldwork consisted of visual inspection of the bankline by boat for each of the five water courses, as well as pedestrian survey and shovel testing along each bank that was considered to have a high probability for containing cultural resources. A total of 25 archeological sites were identified (Sites 16LY5 - 16LY7, 16LY10, 16LY12 - 16LY14, 16LY17, 16LY22 – 16LY26, 16LY28, 16LY29, 16LY55, 16LY61 – 16LY63, 16SM15, 16SM17, 16SM20, 16VM104, 16VM126, and 16VM127). Thirteen additional previously recorded sites also were discussed with reference to the catalog numbers assigned by the University of Southwestern Louisiana; however, the corresponding official state site numbers were not noted. These included Sites USL16IB2, USL16SL2, USL16SL31, USL16SM6, USL16SM13, USL16SM18, USL16SM20, USL16SM21, USL16SM24 – USL16SM26, USL16VM11, and USL16VM17.

Four sites (16LY6, 16LY7, 16LY14, and 16LY62) reportedly contained both prehistoric and historic period components; the remaining 34 sites produced evidence of Paleo-Indian, Archaic, Poverty Point, Tchefuncte, Marksville, Issaquena, Troysville, Coles Creek, and Plaquemine period components. The impacts of the proposed maintenance work upon the recorded sites was unknown. While none of the sites were assessed to determine their National Register eligibility, recommendations were presented for each site in the event that the proposed project area changed or the sites were threatened in the future. Two sites (16LY13 and 16LY63) required no additional work; 19 sites (16LY10, 16LY12, 16LY22, 16LY24, 16LY25, 16LY26, 16LY28, 16LY29, 16LY55, 16LY62, 16VM104, 16VM127, USL16SL31, USL16SM6, USL16SM18, USL16SM20, USL16SM21, USL16SM25, and USL16SM26) were recommended for intermittent monitoring; 15 sites (16LY5, 16LY6, 16LY7, 16LY14, 16LY17, 16LY23, 16LY61, 16SM15, 16SM17, 16SM20, 16VM126, USL16SL2, USL16SM13, USL16VM11, and USL16VM17) were recommended for additional testing; a single site (USL16IB2) was recommended for preservation; and one site (USL16SM24) was recommended for data recovery or avoidance. Of the 25 sites for which official state site numbers were noted, seventeen (Sites 16LY5, 16LY6, 16LY10, 16LY12, 16LY13, 16LY22, 16LY24, 16LY25, 16LY26, 16LY28, 16LY29, 16LY55, 16LY61, 16LY62, 16LY63, 16SM15, and 16SM20) are situated within 1.6 km (1 mi) of the current project area and are discussed below.

In January and February 1978, William McIntire conducted a Phase I cultural resources survey and archeological inventory, utilizing helicopter, vehicular, and pedestrian survey augmented by limited shovel and auger testing, in response to a proposed Texas-Louisiana Ethylene (TLP) project (McIntire 1978). The exact location of the proposed corridor, as well as the length and width of the right-of-way subjected to survey, were not noted. The resulting inventory identified one previously recorded site (16AC21), and one newly identified site, the O'Brien Site, within the proposed project right-of-way. No state site number was assigned to the O'Brien Site. Additional testing was recommended at both sites in order to determine their site boundaries and significance, and to develop possible mitigation procedures. Neither site is located within 1.6 km (1 mi) of the current project area.

Coastal Environments, Inc. conducted a Phase I cultural resources survey and archeological inventory of Coulee Ile des Cannes, Lafayette Parish, in March of 1986 (Whelan 1986). This survey was undertaken on behalf of Lafayette Parish government in

anticipation of a number of proposed drainage improvements. The proposed project area originated at the confluence of the Coulee Ile des Cannes and the Vermilion River, and terminated 28.5 km (17.7 mi) down the coulee, just south of Louisiana State Road 98. The right-of-way area measured 45.7 m (150 ft) in width, and extended along either bank of the waterway. Fieldwork included pedestrian survey augmented by shovel testing in high probability areas defined as elevated areas, hillocks, or ridges (Whelan 1986:13).

Three previously recorded sites were revisited as a result of this investigation: Sites 16LY1, 16LY51, and 16VM7. Sites 16LY1 and 16VM7 had been altered significantly by residential construction and landscaping; no cultural material was identified at either site. Whelan (1986) stated that the third site, 16LY51, could not be relocated accurately due to ambiguities found on the previously submitted site form; however, no artifacts were observed within the area. Whelan (1986) did not assess the eligibility of sites 16LY1, 16LY51, and 16VM7. Because past dredging of the river had left thick spoil deposits along the banks, Whelan (1986) noted that the possibility existed that archeological sites may have been buried and therefore, not identified. With this in mind, Whelan (1986) recommended that the Division of Archaeology in Baton Rouge be contacted before beginning the project to ascertain what discovery procedures would be followed in the event that a site was located. Only one of these sites (16LY1) is situated within 1.6 km (1 mi) of the currently proposed project area; it is discussed below.

Dennis Jones and Malcolm Shuman of the Museum of Geoscience at Louisiana State University conducted a pedestrian survey between October, 1990, and June, 1991, of all prehistoric period mound sites within Acadia, Lafayette, and St. Landry parishes (Jones and Shuman 1991). This study was part of a larger National Park Service project designed to investigate all of the mound sites in Louisiana. The project was funded by the Department of the Interior, through the Department of Culture, Recreation and Tourism, Office of Cultural Development, Division of Archaeology, and by Federal funds designated for the identification and protection of historic properties. A total of 35 mound sites were visited; 13 of these were existing mound sites (16SL1 - 16SL3, 16SL6, 16SL8, 16SL10, 16SL11, 16SL18, 16SL20, 16SL34, 16SL96, 16SL111, and 16SL112), while the remaining 22 locations represented either destroyed or misreported sites (16AC1, 16AC2, 16LY1, 16LY2, 16LY7, 16LY10, 16LY55, 16SL9, 16SL14, 16SL25, 15SL27, 16SL31 – 16SL33, 16SL36, 16SL41, 16SL94, 16SL97, 16SL109, and 16SL113 – 16SL115).

Intensive mapping, pedestrian survey, archival research, and local interviews were conducted in order to record the condition of the sites, and to determine their cultural affiliations. No subsurface investigations were carried out at any of the sites. All of the mounds identified in Lafayette Parish (16LY1, 16LY2, 16LY7, 16LY10, and 16LY55) either had been destroyed or misreported as to location. While none of the sites were assessed explicitly applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]), research potential assessments were made for 30 of the sites. Seven were rated as "good," 14 were scored "fair," and 8 were assessed as "poor." Of the five Lafayette Parish locations visited, four were characterized as poor, and the remaining site had only fair research potential. Four of these sites (16LY1, 16LY2, 16LY10, and 16LY55) are situated within 1.6 km (1 mi) of the current study area; they are discussed below.

During September and October 1995, AR Consultants of Dallas, Texas, conducted a Phase I cultural resources survey and archeological inventory of a proposed propylene pipeline route that extended approximately 426 km (265 mi) from Sorrento, Louisiana, to Mont Belvieu, Texas (Skinner et al. 1995). This cultural resources survey was undertaken on behalf of Concha Chemical Pipeline Company. The proposed route passed through a portion of seven

southwestern Louisiana parishes (Ascension, Iberville, St. Martin, Lafayette, Acadia, Jefferson Davis, and Calcasieu Parishes), and reportedly was co-located adjacent to an existing Shell Pipeline Corporation pipeline corridor. Fieldwork consisted of pedestrian survey along a single linear transect augmented by the excavation of shovel tests. No cultural resources were identified, and no additional testing was recommended.

Between October of 1997 and June of 1998, R. Christopher Goodwin & Associates, Inc. of New Orleans conducted a Phase I cultural resources survey and archeological inventory of the proposed TENDS Breaux Bridge System Pipeline Project right-of-way within portions of Vermilion, Lafayette, and St. Martin parishes (Robblee et al. 1999). Survey of the proposed natural gas pipeline corridor, which was 30.5 m (100 ft) wide and 47.5 km (29.5 mi) long, was completed on behalf of Bridgeline Gas Distribution LLC of St. Rose, Louisiana. Pedestrian survey augmented by shovel testing resulted in the identification of archeological Sites 16VM148 – 16VM151, and 16LY82 – 16LY93. In addition, four non-site cultural resources loci (V02-02, V07-01, V07-02, and LAF10-1), and four standing structures (22-1 – 22-4), were noted during survey.

Sites 16LY82 - 16LY84, 16LY86 – 16LY92, 16VM148, 16VM149, 16VM141, and 16VM152 contained historic period components, while the remaining three sites (16LY85, 16LY93, and 16VM150) contained both prehistoric and historic period artifacts. In addition, Robblee et al. (1999) noted that all four of the non-site cultural resource loci (V02-02, V07-01, V07-02, and LAF10-1) consisted of scatters of historic period artifacts. One site (16LY87) was assessed as potentially eligible for listing in the National Register of Historic Places. This site contained in situ brick piers and a brick lined well within the northwestern corner of the site; however, Robblee et al. (1999) reported that the potentially intact portions of Site 16LY87 were situated outside the Area of Potential Effect, and no additional testing of the site was recommended. The remaining 16 archeological sites, four non-site loci, and four standing structures were evaluated as not significant, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]); no additional testing or recordation was recommended. Sites 16VM148 – 16VM151 and 16LY82 – 16LY93, the non-site cultural resources loci (V02-02, V07-01, V07-02, and LAF10-1), and four standing structures (22-1 – 22-4) are not situated within 1.6 km (1 mi) of the currently proposed project area.

Parsons Engineering Science, Inc. of Fairfax, Virginia conducted Phase I cultural resources surveys and archeological inventories during March of 1998 at eight 90th Regional Support Command facilities located throughout the state of Louisiana (Parsons Engineering Science, Inc. 1998). These surveys were conducted on behalf of the Department of the Army, 90th Regional Support Command, North Little Rock, Arkansas and Detachment 1/Human Systems Center, Occupational Environmental Health Directorate, Brooks Air Force Base, San Antonio, Texas. Only one of the eight areas subjected to cultural resources survey (Lafayette Memorial USARC) was situated within the vicinity (i.e. 3.2 ha [2 mi]) of the current project area.

Parsons Engineering Science, Inc. (1998) reported that the Lafayette Memorial USARC survey area measured 1.3 ha (3.2 ac) in size and was situated within Section 141 of Township 9S, Range 5E, of Lafayette Parish. Pedestrian survey augmented by shovel testing resulted in the identification of Site 16LY96. The site was described as a scatter of historic period artifacts that dated from ca. 1850 to post 1880. Because Parsons Engineering Science, Inc. (1998) assessed Site 16LY96 as not significant applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]), no additional testing of the site was recommended. Site 16LY96 is situated within 1.6 km (1 mi) of the currently proposed project area; it is discussed below.

Previously Recorded Archeological Sites Located within 1.6 km (1 mi) of the Proposed Vermilion River RSS Project Area

A total of 43 previously recorded sites have been identified within 1.6 km (1 mi) of the currently proposed Vermilion River RSS project area (Table 7). Of these, 24 sites contained only prehistoric period components, and 13 represented historic period occupation. The remaining six sites contained both prehistoric and historic period components. Sixteen of the 43 previously recorded sites (16LY1 – 16LY3, 16LY5, 16LY10, 16LY24, 16LY25, 16LY29, 16LY50, 16LY55, 16LY58, 16LY63, 16LY68, 16LY99, 16SM15, and 16SM18) are situated immediately adjacent to the currently proposed project area (i.e., the Vermilion River); however, none are located within the Area of Potential Effect. Each site is discussed below in site number order by parish.

Lafayette Parish. Site 16LY1 originally was recorded in 1940 by Edwin B. Doran, Jr., who described it as a prehistoric period mound and village site situated within Section 83 of Township 10S, Range 4E. No additional information concerning the mound or its cultural affiliation was reported on the original State of Louisiana Site Record Form. When Coastal Environments, Inc. (Whelan 1986) attempted to relocate Site 16LY1 during the Phase I cultural resources survey and archeological inventory of Coulee Ile des Cannes, they noted that the recorded site area had been developed residentially. No indication of Site 16LY1 was identified during the 1986 survey.

The Museum of Geoscience at Louisiana State University subsequently attempted to relocate Site 16LY1 in the early 1990s during a pedestrian survey of previously recorded prehistoric mound sites situated in Acadia, Lafayette, and St. Landry parishes (Jones and Shuman 1991). According to the authors, the site area had been developed as a residential subdivision during the 1980s, thus destroying Site 16LY1. No indication of Site 16LY1 was identified; therefore, Jones and Shuman (1991) assessed the site as not significant. No additional investigation of the site area was recommended.

Site 16LY2 was described as three prehistoric mounds situated within Section 90 of Township 9S, Range 5E. The site originally was recorded by Doran during April of 1941; however, the Louisiana site form contained no data concerning what, if any, artifacts were noted at the site. In addition, Doran did not indicate the cultural affiliation of Site 16LY2.

Gulf South Research Institute (1976) reportedly attempted to relocate Site 16LY2 during archeological inventory of the proposed Lafayette Loop project right-of-way; however, no evidence of the site was noted within its recorded location. Gulf South Research Institute did not assess the significance of Site 16LY2, and no additional testing of the reported site area was recommended.

Jones and Shuman (1991) also attempted to relocate Site 16LY2 during their Phase I survey of previously recorded prehistoric mound sites within Acadia, Lafayette, and St. Landry parishes. Jones and Shuman (1991) noted that the recorded area of Site 16LY2 had been developed as a golf course, thereby destroying the site. Site 16LY2 was not relocated by Jones and Shuman (1991); therefore, the site was assessed as not significant, and no additional testing was recommended.

Site 16LY3 was recorded on an unspecified date by an anonymous party affiliated with Louisiana State University. The site, which was located in Section 141 of Township 9S, Range 5E, was described as a scatter of prehistoric ceramic sherds and lithics; however, no information was available regarding the quantity and type of artifacts from the site. Site 16LY3 was not assessed, and no recommendations concerning additional testing were noted on the State of Louisiana Site Record Form.

Sites 16LY5 and 16LY6 originally were recorded by Gibson during his 1975 Phase I cultural resources survey and inventory of portions of Bayou Teche, Vermilion River,

Table 7. Previously Recorded Archeological Sites Located Within 1.6 km (1 mi) of the Proposed Vermilion River RSS Project Area

Site No.	USGS 7.5' Quad	Site Description	Cultural Affiliation	Field Methodology	NRHP Eligibility	Recorded By
Lafayette Parish						
16LY1	Lafayette, La.	Prehistoric period mound and village	Undetermined prehistoric period	Pedestrian survey	Not significant	Doran 1940; Jones and Shuman 1991
16LY2	Broussard, La.	Three prehistoric period mounds and village	Undetermined prehistoric period	Pedestrian survey	Not significant	Doran 1941; Jones and Shuman 1991
16LY3	Broussard, La.	Prehistoric period artifact scatter	Undetermined prehistoric period	Pedestrian survey	Not assessed	LSU n.d.
16LY5	Broussard, La.	Prehistoric period artifact scatter	Poverty Point, Tchefuncte, Issaquena, Coles Creek, and Plaquemine periods	Pedestrian survey	Not significant	Gibson 1975
16LY6	Broussard, La.	Prehistoric and historic period artifact scatter	Possible Poverty Point and Tchefuncte periods; Undetermined historic period	Pedestrian survey	Not assessed	Gibson 1975
16LY8	Broussard, La.	Prehistoric period shell midden	Undetermined prehistoric period	Pedestrian survey	Not assessed	Leanpacher and Burnaham 1972
16LY10	Broussard, La.	Prehistoric period mound	Undetermined prehistoric period	Pedestrian survey	Not significant	Gibson 1975; Jones and Shuman 1991
16LY12	Broussard, La.	Prehistoric period artifact scatter	Late Archaic period	Pedestrian survey	Not significant	Gibson 1975
16LY13	Broussard, La.	Prehistoric period artifact scatter	Poverty Point and Tchefuncte periods	Pedestrian survey	Not assessed	Gibson 1975
16LY22	Broussard, La.	Prehistoric period artifact scatter	Archaic, Tchefuncte, Marksville, Issaquena, Troyville, Coles Creek, and Plaquemine periods	Pedestrian survey	Not assessed	McIntire 1953
16LY24	Broussard, La.	Prehistoric and historic period artifact scatter	Undetermined prehistoric and historic periods	Pedestrian survey	Not assessed	Perry and Staub 1976
16LY25	Broussard, La.	Prehistoric period artifact scatter	Undetermined prehistoric period	Pedestrian survey	Not assessed	Gibson 1975
16LY26	Lafayette, La.	Prehistoric period artifact scatter	Undetermined prehistoric period	Pedestrian survey	Not assessed	Gibson 1975
16LY28	Broussard, La.	Prehistoric period artifact scatter	Late Troyville and early Coles Creek periods	Pedestrian survey and unspecified subsurface testing	Not significant	Gibson 1975
16LY29	Broussard, La.	Prehistoric period artifact scatter	Undetermined prehistoric period	Pedestrian survey	Not assessed	Gibson 1975
16LY30	Broussard, La.	Prehistoric period artifact scatter	Undetermined prehistoric period	Pedestrian survey	Not assessed	Gibson 1975
16LY44	Lafayette, La.	Historic period artifact scatter	Undetermined historic period	Pedestrian survey	Not significant	Gulf South Research Institute 1976
16LY46	Lafayette, La.	Historic period artifact scatter	Undetermined historic period	Pedestrian survey	Not assessed	Gulf South Research Institute 1976

Site No.	USGS 7.5' Quad	Site Description	Cultural Affiliation	Field Methodology	NRHP Eligibility	Recorded By
16LY50	Broussard, La.	Prehistoric period artifact scatter	Undetermined prehistoric period	Pedestrian survey	Not assessed	Clendenen and Broussard 1974
16LY52	Broussard, La.	Historic period artifact scatter	20th century historic period	Pedestrian survey	Not assessed	Staub and Perry 1976
16LY55	Lafayette, La.	Prehistoric period artifact scatter	Tchula, late Marksville – early Baytown and Plaquemine periods	Pedestrian survey, auger testing, and backhoe excavation	Potentially significant	Gibson 1976; Jones and Shuman 1991; Roberts 1999
16LY56	Lafayette, La.	Historic period artifact scatter	Late 19th – early 20th century historic period	Pedestrian survey and shovel testing	Not significant	Weinstein and Pearson 1980
16LY58	Lafayette, La.	Prehistoric and historic period artifact scatter	Undetermined prehistoric period; Late 18th – late 19th century historic period	Pedestrian survey, shovel testing, and unit excavation	Not significant	Weinstein and Pearson 1980
16LY59	Lafayette, La.	Historic period artifact scatter	Late 19th – early 20th century historic period	Pedestrian survey and shovel testing	Not significant	Whelan and Castille 1986; Coxe 1998
16LY61	Broussard, La.	Prehistoric and historic period artifact scatter	Tchefuncte, Marksville, Issaquena, Troyville, Coles Creek and Plaquemine periods; Undetermined historic period	Pedestrian survey and unit excavation	Not assessed	Gibson 1975
16LY62	Broussard, La.	Prehistoric and historic period artifact scatter	Archaic and Plaquemine periods; Undetermined historic period	Pedestrian survey	Not significant	Gibson 1975; McGimsey 1996
16LY63	Lafayette, La.	Prehistoric period artifact scatter and unassociated mastodon bones	Archaic period	Unspecified type of excavation	Not significant	USL 1975
16LY65	Broussard, La.	Historic period artifact scatter	19th – 20th century historic period	Pedestrian survey	Not assessed	Russo, Coleman, and Shreve 1993
16LY67	Lafayette, La.	Historic period cemetery and artifact scatter	Mid 19th – early 20th century historic period	Pedestrian survey and auger testing	Not assessed	Russo 1993
16LY68	Lafayette, La.	Isolated Clovis projectile point/knife	Paleo-Indian period	Pedestrian survey	Not assessed	Marckese 1993
16LY72	Lafayette, La.	Historic period artifact scatter	Undetermined historic period	Pedestrian survey	Not assessed	Gulf South Research Institute 1976
16LY73	Lafayette, La.	Historic period artifact scatter	Possible 19th century historic period	Pedestrian survey	Not assessed	Gulf South Research Institute 1976
16LY76	Broussard, La.	Historic period artifact scatter	Undetermined historic period	Pedestrian survey	Not assessed	Gulf South Research Institute 1976
16LY77	Lafayette, La.	Historic period artifact scatter	Undetermined historic period	Pedestrian survey	Not assessed	Gulf South Research Institute 1976
16LY78	Lafayette, La.	Historic period artifact scatter	Undetermined historic period	Pedestrian survey	Not assessed	Gulf South Research Institute 1976
16LY80	Lafayette, La.	Historic period cemetery	19th century historic period	Pedestrian survey	Not assessed	McGimsey 1996
16LY96	Broussard, La.	Historic period artifact scatter	19th century historic period	Pedestrian survey and shovel testing	Not significant	Whitley 1998

Site No.	USGS 7.5' Quad	Site Description	Cultural Affiliation	Field Methodology	NRHP Eligibility	Recorded By
16LY99	Lafayette, La.	Prehistoric period artifact scatter	Early Marksville and Coles Creek period	Pedestrian survey and auger testing	Potentially significant	Roberts 1999
St. Martin Parish						
16SM15	Broussard, La.	Prehistoric and historic period artifact scatter	Tchefuncte period; Undetermined historic period	Pedestrian survey and unit excavation	Not assessed	Beecher, Peny, and Staub 1976
16SM18	Broussard, La.	Two prehistoric period mounds and village	Possible Tchefuncte period	Pedestrian survey	Not assessed	Doran 1941
16SM20	Broussard, La.	Prehistoric period artifact scatter	Poverty Point and Tchefuncte periods	Pedestrian survey	Not assessed	Doran 1941; McGimsey 1995
16SM81	Broussard, La.	Possible prehistoric period mound	Marksville period	Pedestrian survey and the excavation of a single soil core from the west side of mound	Potentially significant	McGimsey 1995
Vermilion Parish						
16VM126	Lafayette, La.	Prehistoric period artifact scatter	Possible Coles Creek and/or Plaquemine periods	Pedestrian survey	Not assessed	Gibson 1976

and Freshwater Bayou (Gibson 1975). These sites subsequently were reinvestigated later that same year as part of Gibson's (1976) archeological inventory of the Lafayette Municipal Airport.

Site 16LY95 was described as a surface scatter of prehistoric artifacts situated within Section 98 of Township 9S, Range 5E. While the overall size of Site 16LY5 was not reported, pedestrian survey of the site area resulted in the collection of 920 prehistoric period ceramic sherds representing 22 distinctive types (Tchefuncte Stamped, Tammany Punctated, Lake Borgne Incised, Orleans Punctated, Tchefuncte Incised, Marksville Incised, Churupa Punctated, Marksville Stamped, Mulberry Creek Cork Marked, Larto Red, Evansville Punctated, Hollyknowe Ridge Pinched, French Fork Incised, Alligator Incised, Chevalier Stamped, Pontchartrain Check Stamped, Coles Creek Incised, Plaquemine Brushed, Mazique Incised, L'eau Noir Incised, Avoyelles Punctated, Maddox Engraved, and Leland Incised); 757 various baked clay artifacts; 162 Poverty Point objects; 44 projectile points/knives (including Gary, Wells, Evans, Sinner, Elam, Ellis, Delhi, Marshall, Palmillas, Cliffton, and Mohriss types), and numerous other lithic artifacts. Site 16LY5 appeared to represent Poverty Point, Tchefuncte, Issaquena, Coles Creek, and Plaquemine periods of occupation. According to data presented on the site record form, Site 16LY5 had been destroyed completely by the construction of an apartment complex, tennis courts, and a golf course. As a result, the site was assessed as not significant, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]); no recommendations concerning additional testing of Site 16LY5 were reported.

Site 16LY6, identified within Section 32 of Township 9S, Range 5E, was described as a surface scatter of prehistoric and historic period artifacts. Pedestrian survey of the site area resulted in the collection of 11

Tchefuncte Plain prehistoric period ceramic sherds, 73 amorphous baked clay fragments, 6 projectile points/knives (including Gary, Kent, Pontchartrain, Dallas, and Elam points), 4 unidentified projectile points/knives, 2 projectile point/knife fragments, 9 preforms, 8 flakes, and 1 historic period ceramic sherd. The overall size of Site 16LY6 was not reported. Gibson suggested that the prehistoric components present at Site 16LY6 possibly represented Poverty Point and Tchefuncte periods of occupation. No date of occupation was reported for the historic period component. Site 16LY6 was not assessed applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]); however, additional testing of the site was recommended by Gibson (1976).

Site 16LY8 was identified during unspecified road construction within Section 94 of Township 9S, Range 5E. The site, which was recorded during May of 1972 by Robert Leanpacher and Jackie Burnaham, was described as a prehistoric shell midden. While the overall size of Site 16LY8 was not noted on the State of Louisiana Site Record Form, a pedestrian survey of the site area resulted in the collection of one unspecified projectile point/knife and an unreported quantity and type of prehistoric ceramic sherds. The cultural affiliation of Site 16LY8 was undetermined, and the site was not assessed applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]). No recommendations concerning additional testing of the site were noted on the site record form.

Site 16LY10 was recorded in 1975 by Jon Gibson, who identified the site within Section 32 of Township 9S, Range 5E (Gibson 1975, 1976). The site was described as a prehistoric period conical mound. Gibson (1975, 1976) noted that the mound had been destroyed completely by the construction of a runway at the Lafayette Municipal Airport; however, a pedestrian survey of the area resulted in the collection of unspecified quantities and types of prehistoric period ceramic sherds, projectile points/knives, and flakes. It was suggested that the site possibly dated from the Poverty Point, Tchefuncte, and Marksville periods. Although Gibson (1975, 1976) did not assess Site 16LY10, no additional testing of the site was recommended (Gibson 1976).

During the early 1990s, Dennis Jones and Malcolm Shuman attempted to relocate Site 16LY10 during a survey of previously recorded prehistoric mound sites within Acadia, Lafayette, and St. Landry parishes (Jones and Shuman 1991). The authors reported that no evidence of Site 16LY10 was identified during their survey. According to data presented on the updated (1991) site record form, Site 16LY10 was assessed as not significant, and no additional testing of the site was recommended.

Sites 16LY12 and 16LY13 were recorded by Gibson in 1975 (Gibson 1975, 1976). Both sites were identified within the confines of the Lafayette Municipal Airport in Section 32 of Township 9S, Range 5E. Site 16LY12 was described as a 10 m^2 (107.6 ft^2) surface scatter of prehistoric artifacts. Pedestrian survey of the site reportedly resulted in the recovery of 1 unidentified prehistoric period ceramic sherd, 1 adze, 1 bannerstone, 1 steatite vessel fragment, 1 flake, 1 piece of lithic shatter, and an undetermined quantity of unidentified calcined bone fragments. It was suggested that Site 16LY12 represented a late Archaic period occupation. While Gibson (1976) did not specifically assess Site 16LY12, he did recommend additional testing of the site. However, according to data presented on the State of Louisiana Site Record Form, the integrity of the site reportedly had been impaired by runway construction at the airport. Thus, Site 16LY12 was assessed as not significant, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]).

Site 16LY13 also was described as a surface scatter of prehistoric artifacts but the overall size of the site was not noted. According to Gibson (1975, 1976), Site 16LY13 was identified during construction of a runway at the Lafayette Municipal Airport. Pedestrian survey of the site area resulted in the collection of 10 Tchefuncte

Plain prehistoric period ceramic sherds, 1 Tchefuncte Stamped prehistoric period ceramic sherd, 1 Tammany Punctated prehistoric period ceramic sherd, 1 Lake Borgne prehistoric period ceramic sherd, 38 amorphous baked clay objects, 4 unidentified projectile points/knives fragments, 1 unidentified biface fragment, 1 gorget fragment, 1 endscraper, 115 flakes, 10 pieces of lithic shatter, 10 pieces of fire cracked rock, 2 pieces of red ochre, 34 unmodified lithics, and 1 unidentified fragment of calcined bone. Site 16LY13 represented Poverty Point and Tchefuncte periods of occupation; however, the site reportedly was destroyed during airport runway construction (Gibson 1976). As a result, no additional testing of Site 16LY13 was recommended (Gibson 1976).

Site 16LY22 originally was recorded in 1953 by William McIntire, who identified the site within Section 141 of Township 9S, Range 5E. According to Gibson (1975), a pedestrian survey of the site completed by McIntire resulted in the collection of 61 prehistoric ceramic sherds including 4 Alexander Pinched, 2 Tammany Punctated, 1 Tchefuncte Incised, 1 Tchefuncte Stamped, 4 Marksville Incised, 4 French Fork Incised, 3 Churupa Punctated, 11 Mazique Incised, 4 Coles Creek Incised, 10 Pontchartrain Check Stamped, 2 Beldeau Incised, 11 Plaquemine Brushed, and 2 Maddox Engraved. It was suggested that Site 16LY22 represented Archaic, Tchefuncte, Marksville, Issaquena, Troyville, Coles Creek, and Plaquemine periods of occupation (Gibson 1975). The site was not assessed to determine its eligibility for listing in the National Register of Historic Places, and a notation on the State of Louisiana Site Record Form reports that Site 16LY22 was destroyed.

Site 16LY24 was recorded during March of 1976 by Perry and Staub. The site was identified during a Phase I cultural resources survey and archeological inventory of Bayou Teche, Vermilion River, and Freshwater Bayou that was completed in 1975 by the University of South Louisiana (Gibson 1975). Gibson (1975) collected a single Tchefuncte Plain prehistoric ceramic sherd from Site 16LY24. No additional information concerning the site was reported; however, Gibson (1975) did recommend that the site be monitored during proposed dredging of the Vermilion River.

Gulf South Research Institute relocated Site 16LY24 during a Phase I cultural resources survey of the proposed Lafayette Loop highway right-of-way (Gulf South Research Institute 1976). Pedestrian survey of the site area resulted in the collection of 1 unidentified prehistoric ceramic sherd, 1 historic period ceramic sherd, and an unspecified quantity of mussel shells. In addition, a single standing structure with an associated wooden cistern was noted in the vicinity of Site 16LY24. While the date of the historic period component identified at Site 16LY24 was undetermined, it was suggested that the prehistoric component represented a Tchefuncte period occupation. Site 16LY24 was not assessed applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]); however, Gulf South Research Institute (1976) recommended that additional testing of the site be conducted.

Sites 16LY25, 16LY26, 16LY28, 16LY29, and 16LY30 were recorded by Jon Gibson in 1975. Of these, Sites 16LY25, 16LY26, 16LY28, and 16LY29 were identified in 1975 by the University of Southwestern Louisiana during a Phase I cultural resources survey and archeological inventory of Bayou Teche, Vermilion River, and Freshwater Bayou (Gibson 1975). The remaining site (16LY30) was located during an archeological inventory of the Lafayette Municipal Airport conducted during December of 1975 by Jon Gibson (Gibson 1976). In addition, Sites 16LY25 and 16LY28 also were relocated as part of this survey (Gibson 1976).

Site 16LY25 was described as a single unidentified prehistoric period ceramic sherd identified within Section 28 of Township 9S, Range 5E. Pedestrian survey of the site area failed to recover any additional cultural material. The cultural affiliation of Site 16LY25 was undetermined. Gibson (1975, 1976) did not assess the significance of Site

16LY25; however, Gibson (1976) recommended that additional testing of the site be conducted if subsurface disturbance was planned,

Site 16LY26 was situated within Section 68 of Township 10S, Range 4E. The site also was described as consisting of a single, unidentified prehistoric period ceramic sherd recovered from the ground surface during pedestrian survey (Gibson 1975). The overall size of the site was not noted, nor was its cultural affiliation determined. Site 16LY26 was not assessed applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]), and no recommendations concerning additional testing of the site were made.

Site 16LY28 was described as a scatter of prehistoric artifacts identified within Section 142 of Township 9S, Range 5E. While the size of the site was not reported, a pedestrian survey of the area reportedly resulted in the collection of 1 French Fork Incised, *var. French Fork* prehistoric period ceramic sherd, 2 unidentified prehistoric period ceramic sherds, and 1 lithic flake (Gibson 1975, 1976). Site 16LY28 appeared to represent a late Troyville and/or early Coles Creek period occupation. Gibson (1976) noted that the site had been impacted adversely by prior runway construction at the Lafayette Municipal Airport. Site 16LY28 was assessed as not significant, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]). Nevertheless, additional testing was recommended only if further construction was planned in the immediate vicinity of the site.

Site 16LY29 also was described as a surface scatter of prehistoric period artifacts. The site was identified at the Beaver Park boat launch within Section 142 of Township 9S, Range 5E. Gibson (1975) stated that during pedestrian survey of the boat launch parking lot (which had been graded previously), two unidentified prehistoric ceramic sherds were recovered from a pedestal of undisturbed soil that supported a tree. No cultural affiliation was reported for Site 16LY29. While the site was not assessed applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]), Gibson (1975) recommended that the site be monitored during any future ground disturbing activities that could impact the site location.

Site 16LY30 was identified within Section 42 of Township 10S, Range 5E. Gibson (1976) described the site as a surface scatter of prehistoric period ceramic sherds; however, the overall dimensions of the site were not reported. Pedestrian survey resulted in the collection of six unidentified prehistoric period ceramic sherds. The cultural affiliation of Site 16LY30 was undetermined. In addition, Gibson (1976) noted that a drainage ditch had been excavated previously through the site. Site 16LY30 was not assessed applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]); however, additional testing of the site was recommended (Gibson 1976).

Sites 16LY44 and 16LY46 were identified in 1976 by Gulf South Research Institute during a Phase I cultural resources survey and archeological inventory of the proposed Lafayette Loop highway right-of-way (Gulf South Research Institute 1976). Site 16LY44 was described as a scatter of historic artifacts situated within Section 72 of Township 10S, Range 4E. Pedestrian survey resulted in the collection of an unspecified number of historic period salt-glazed stoneware, ironstone, and glass fragments; complete bottles with screw-type tops; and bricks. The overall size of Site 16LY44 was not reported. While the date of historic period occupation was undetermined, Gulf South Research Institute (1976:16) described the recovered artifacts as "recent" in origin. Site 16LY44 was assessed as not significant, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]), and no additional testing of the site was recommended.

Site 16LY46 was identified as a surface scatter of prehistoric and historic period artifacts. The overall size of the site, which was located within Section 71 of Township 10S, Range 4E, was not reported. Pedestrian

survey resulted in the collection of unspecified quantities of prehistoric period lithic flakes, historic period ceramic sherds, glass shards, metal, and a single button. Gulf South Research Institute (1976) also noted that a modern residence was present at the site. The dates of both the prehistoric and historic periods of occupation at Site 16LY46 were undetermined. The site was not assessed applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]); however, additional testing of Site 16LY46 was recommended.

Site 16LY50 was recorded by Clendenen and Broussard during September 1974. The site, which was situated within Section 93 of Township 9S, Range 5E, was identified during a Phase I cultural resources survey and archeological inventory of the proposed Lafayette Loop highway right-of-way (Gulf South Research Institute 1976). Site 16LY50 was described as a surface scatter of prehistoric period artifacts; its overall size was not noted. Gulf South Research Institute (1976) stated that pedestrian survey resulted in the collection of unspecified quantities and types of prehistoric period ceramic sherds, and a grinding stone fragment. The cultural affiliation of Site 16LY50 was undetermined, and the site was not assessed applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]). Gulf South Research Institute (1976) recommended that additional testing of Site 16LY50 be conducted.

While Site 16LY52 also was identified by Gulf South Research Institute (1976) during the archeological inventory of the proposed Lafayette Loop right-of-way corridor, it was formally recorded by Staub and Perry during March of 1976. The site, which was described as an historic period standing structure and associated artifact scatter, was situated within Section 93 of Township 9S, Range 5E. The size of the site was not reported. Pedestrian survey resulted in the collection of 3 historic period ceramic sherds, 3 glass shards, and an unspecified quantity of plastic fragments. Gulf South Research Institute (1976) noted that the historic standing structure present at Site 16LY52 was being utilized for hay storage; however, the authors suggested the structure originally was residential in nature. Site 16LY52 reportedly dated from the twentieth century. National Register eligibility of the site was not assessed, but additional testing of the site was recommended.

Site 16LY55 originally was recorded in 1976 by Jon Gibson during a Phase I cultural resources survey and archeological inventory of Bayou Teche, Vermilion River, and Freshwater Bayou (Gibson 1975). The site, situated at the foot of Teche Street within Section 81 of Township 10S, Range 4E, was described as a prehistoric scatter eroding from the bluffline of the Vermilion River. Gibson (1975) noted that Site 16LY55 measured 30 x 90 m (98.4 x 295.3 ft). Pedestrian survey resulted in the collection of an unspecified quantity and type of prehistoric ceramic sherds; however, the cultural affiliation of Site 16LY55 was undetermined. Although Gibson (1975) did not assess the significance of Site 16LY55, additional testing of the site was recommended.

Coastal Environments, Inc. reinvestigated Site 16LY55 in 1980 while conducting a Phase I cultural resources survey and archeological inventory of the proposed South College Road extension right-of-way (Coastal Environments, Inc. 1982). Pedestrian survey of the site area resulted in the collection of 2 Tchefuncte Plain, *var. Tchefuncte* prehistoric period ceramic sherds, 1 possible Baytown Plain, *var. Marksville* prehistoric period ceramic sherd, and 14 Baytown Plain prehistoric period ceramic sherds for which the variety was undetermined. Coastal Environments, Inc. (1982) reported that the artifacts had eroded from a 24 m (78.7 ft) long section of bluff above the Vermilion River; however, the depth from which these materials were eroding was not noted. The excavation of an unspecified number of shovel tests along the top of the bluff failed to identify any additional cultural materials. It was suggested that Site 16LY55 represented Tchula and Marksville periods of occupation.

Coastal Environments, Inc. subsequently excavated four backhoe trenches that measured 3 – 4 m (9.8 – 13.1 ft) in length by 1.5 – 2 m (4.9 – 6.6 ft) in depth in the vicinity of Site 16LY55. No cultural materials were identified within any of these four backhoe trenches; however, four additional Baytown Plain, *var. unspecified* prehistoric period ceramic sherds were collected from the surface of the site. Coastal Environments, Inc. (1982) assessed Site 16LY55 as not significant, and no additional testing was recommended.

Site 16LY55 was relocated in 1999 by Coastal Environments, Inc. while conducting a Phase I cultural resources survey and archeological inventory of a portion of the right descending bank of the Vermilion River prior to the proposed construction of a flood wall (Roberts 2000). Pedestrian survey augmented by auger testing resulted in the collection of unspecified quantities and types of prehistoric ceramic sherds, lithic flakes, unmodified cobbles, tested cobbles, and fish bones; however, the depths from which these materials were recovered were not noted. The site covered an area of 40 x 150 m (131.2 x 492.1 ft). Roberts (2000) suggested that the site represented late Marksville – early Baytown and Plaquemine periods of occupation. While Site 16LY55 previously had been assessed by Coastal Environments, Inc. (1982) as not significant, Roberts (2000) evaluated the site as potentially significant, and recommended further testing.

In April of 1980, Richard Weinstein and Charles Pearson recorded Site 16LY56, located within Section 47 of Township 10S, Range 4E, during a Phase I cultural resources survey of the proposed South College Road Extension corridor (Coastal Environments 1982). The site was a scatter of historic period artifacts, measuring 30 x 60 m (98.4 x 196.9 ft) in size. Pedestrian survey resulted in the collection of 19 historic period ceramic sherds, 10 glass shards, 1 brick fragment, 1 piece of slate, 1 fragment of cement, 1 tile fragment, 2 pieces of ceramic sewer pipe, 2 unidentified metal fragments, 3 oyster shells, and 1 unidentified mammal bone. Coastal Environments, Inc. (1982:11-12) reported that the excavation of a single shovel test resulted in the collection of three additional historic period ceramic sherds from the upper portion of the shovel test. Site 16LY56 appeared to represent a late nineteenth to early twentieth century period occupation. The site was assessed as not significant, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]), and no additional testing was recommended.

Site 16LY58, which also was recorded by Weinstein and Pearson in 1980, was situated within Section 45 of Township 10S, Range 4E and Section 43 of Township 10S (Coastal Environments 1982). Site 16LY58, which reportedly covered an area of 60 x 200 m (196.9 x 656.2 ft), was described as a scatter of prehistoric and historic period artifacts. A total of 185 historic period ceramic sherds, 6 glass shards, 10 brick fragments, 2 iron fragments, and 4 fragments of calcined bone were collected during pedestrian survey of the site area. Excavation of an unspecified quantity of shovel tests resulted in the recovery of 12 additional historic period ceramic sherds, brick fragments, oyster shells, and 2 Baytown Plain, *var. unspecified* prehistoric period ceramic sherds. The historic period component appeared to date from the late eighteenth to late nineteenth centuries, but no period of occupation was reported for the prehistoric component. Site 16LY58 was assessed as potentially significant, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]), and additional testing was recommended.

Coastal Environments, Inc. (1982) subsequently conducted additional pedestrian survey and shovel testing at Site 16LY58. Three excavation units measuring 1 x 1 m (3.3 x 3.3 ft), and a single unit measuring 2 x 2 m (6.6 x 6.6 ft), also were excavated at the site. These units yielded an assemblage of 218 historic period ceramic sherds, 39 glass shards, 11 brick fragments, 5 nails, 5 iron fragments, 2 pieces of gravel, 1 onyx pipe fragment, and 28 unspecified bone fragments. Because no in situ cultural features were identified during testing, the

site was reassessed as not significant, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]). No additional testing of Site 16LY58 was recommended; however, Coastal Environments Inc. (1982) did recommend that an archeologist monitor the site to record any cultural features that could be revealed during construction.

Site 16LY59 originally was recorded by Jamie Whelan and George Castille in 1986, during Phase I cultural resources survey and archeological inventory conducted prior to proposed construction of a new bridge crossing the Vermilion River within the city of Lafayette (Whelan and Castille 1988). The site, which was situated within Section 62 of Township 10S, Range 4E, reportedly measured 30 x 150 m (98.4 x 492.1 ft) in size and was described as a scatter of historic period artifacts. Pedestrian survey resulted in the collection of 32 historic period ceramic sherds, 1 ceramic caster wheel, 13 glass shards, 1 brick fragment, 1 unidentified mammal bone, and 1 oyster shell. Excavation of six shovel tests resulted in the collection of eight additional artifacts, including 6 glass shards, 1 unidentified piece of metal, and 1 oyster shell. These artifacts were recovered from within the first 26 cm of soil (Whelan and Castille 1988). Site 16LY59 dated from the late nineteenth to early twentieth centuries, and possibly represented the former location of a tenant house. The National Register eligibility of the site was not assessed; however, additional testing was recommended in the event that Site 16LY59 was impacted by proposed bridge construction.

Subsequent Phase II testing of Site 16LY59 was completed during December of 1997 and February of 1998 by Coastal Environments, Inc. as part of an archeological inventory of the proposed River Ranch Development project (Ryan and Coxe 1998). These Phase II investigations included excavation of 55 shovel tests throughout the site area. A total of 108 historic period artifacts, including 38 ceramic sherds, 26 glass shards, 2 unidentified pieces of metal hardware, 33 brick fragments, and 9 pieces of mortar, were recovered from 24 of the excavated shovel tests. Ryan and Coxe (1998) did not identify any intact cultural deposits at Site 16LY59, and they assessed the site as not significant, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]). No additional testing of Site 16LY59 was recommended.

Site 16LY61 was recorded in 1975 by Jon Gibson within Section 5 of Township 10S, Range 5E during a Phase I cultural resources survey and archeological inventory of Bayou Teche, Vermilion River, and Freshwater Bayou (Gibson 1975). Gibson (1975) described Site 16LY61 as a scatter of prehistoric and historic period artifacts that encompassed an area of approximately 6,000 m^2 (64,585.6 ft^2). Pedestrian survey was augmented by excavation of 20 units each measuring 1.5 x 1.5 m (5 x 5 ft). The assemblage included a total of 4,207 prehistoric period ceramic sherds (including Tchefuncte Stamped, Tchefuncte Incised, Lake Borgne Incised, Marksville Stamped, Marksville Incised, Churupa Punctated, Rhinehart Punctated, Landon Red on Buff, Larto Red, Evansville Punctated, Alligator Incised, French Fork Incised, Mazique Incised, Salomon Brushed, Cole Creek Incised, Chevalier Stamped, Pontchartrain Check Stamped, Harrison Bayou Incised, Plaquemine Brushed, L'eau Noir Incised, Tammany Punctated, Orleans Incised, Jaketown Simple Stamped, and Maddox Engraved); 1 boatstone; 39 baked clay fragments; 3 unmodified pebbles; 11 chipped pebbles; 3 pieces of fire cracked rock; 5 pieces of lithic shatter; 20 lithic flakes; 1flake tool; 15 preforms; 4 Scallorn projectile points/knives; 9 Alba projectile points/ knives; 25 Friley projectile points/knives; 2 Catahoula projectile points/knives; 1 Livermore projectile point/knife; 1 Fresno projectile point/knife; 3 Gary projectile points/knives; 18 unidentified projectile points/knives; 4 unidentified projectile point/knife fragments; 1 lithic drill; 1 piece of sandstone; 1 limonite concretion; 7 socketed bone projectile points; 4 deer ulna awls, unspecified quantities of animal and

human bone, 1 dog coprolite, 1 brick fragment, 3 historic period ceramic sherds, and 2 glass shards.

Gibson (1975) also stated that human burials, post molds, and fire pits were noted at Site 16LY61. It was suggested that the prehistoric period occupation present at Site 16LY61 dated from the Tchefuncte, Marksville, Issaquena, Troyville, Coles Creek, and Plaquemine periods; no date was hypothesized for the historic component. Although Site 16LY61 was not formally evaluated, additional testing of the site was recommended.

Site 16LY62, also recorded in 1975 by Jon Gibson, was identified within Section 42 of Township 10S, Range 5E, during an archeological inventory of Bayou Teche, Vermilion River, and Freshwater Bayou (Gibson 1975). Site 16LY62 was described as a scatter of prehistoric and historic period artifacts. While the overall size of Site 16LY62 was not reported, a pedestrian survey of the site area produced an assemblage of 1 Plaquemine Brushed, *var. Plaquemine* prehistoric period ceramic sherd, 18 unidentified prehistoric period ceramic sherds, 1 Scallorn projectile point/knife, 1 Alba projectile point/knife, 1 Gary projectile point/knife, 2 unidentified projectile point/knife fragments, 1 preform, 11 flakes, 2 pieces of lithic shatter, 1 fragment of calcined bone, 1 modern horse tooth, and 4 historic period ceramic sherds. Site 16LY62 thus was occupied during the Archaic and Plaquemine periods. No possible date was suggested for the historic period artifacts recovered from the site. Gibson (1975) did not assess specifically the significance of Site 16LY62; however, intermittent monitoring of the site was recommended. Subsequently, Gibson (1976) reported that the site had been destroyed totally by construction of a runway at the Lafayette Municipal Airport.

Site 16LY62 was revisited during March of 1996 by Chip McGimsey. While no additional data concerning the site appear to have been reported on the State of Louisiana Site Update Record Form, McGimsey did confirm that the site had been destroyed by airport construction.

Site 16LY63 was recorded in 1975 by the University of Southwestern Louisiana, and was identified during a Phase I cultural resources survey and archeological inventory of Bayou Teche, Vermilion River, and Freshwater Bayou (Gibson 1975). The site, which was situated within Section 141 of Township 9S, Range 5E, was described as the anterior portion of an American mastodon that was eroding from the cut bank of the Vermilion River approximately 4 m (13.1 ft) below the ground surface. In addition, two Marcos projectile points/knives were recovered from the site; however, Gibson (1975) noted that they were not directly associated with the mastodon remains. Based on the recovered projectile points/knives, it was suggested that Site 16LY63 dated from the Archaic period. Gibson (1975) stated that the site had been destroyed completely by the construction of a water treatment plant, and he assessed it as not significant, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]). No additional testing of Site 16LY63 was recommended.

Site 16LY65, the former location of Magnolia Plantation, was recorded during February 1993 by Mike Russo, Lisa E. Coleman, and R. Lynn Shreve. Pedestrian survey of the site area, which measured 500 x 500 m (1,640.4 x 1,640.4 ft), resulted in the collection an unspecified quantity of historic period ceramic sherds, glass shards, and brick fragments, indicating a nineteenth century period of occupation. The survey report noted that structures belonging to the De LaSalle Christian Brothers Retirement Monastery had been constructed on the site. The site was not assessed applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]); however, additional testing of the site was recommended.

Site 16LY67, an historic period cemetery and artifact scatter situated within Section 83 of Township 10S, Range 4E, measured 140 x 260 m (459.3 x 853 ft). The site was recorded during May 1993 by Mike Russo. Pedestrian survey augmented by

auger testing yielded an unspecified number of historic period ceramic sherds and brick fragments. Russo stated that glass shards also were noted but not collected from the site. No specific information regarding the cemetery was noted on the State of Louisiana Site Record Form. Site 16LY67 appeared to represent a late nineteenth to early twentieth century historic occupation. The National Register eligibility of Site 16LY67 was not assessed, but additional testing of the site was recommended.

Site 16LY68 was recorded during December 1993 by Thomas Marckese. The site was described as an isolated Clovis projectile point/knife identified within Section 61 of Township 10S, Range 4E. According to data presented on the State of Louisiana Site Record Form, the isolated projectile point/knife was recovered from the ground surface, and no additional cultural materials were collected or observed. Although Site 16LY68 was not assessed applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]), additional testing of the site area was recommended.

Sites 16LY72, 16LY73, 16LY76, 16LY77, and 16LY78 were identified in 1976 by Gulf South Research Institute while conducting a Phase I cultural resources survey and archeological inventory of the proposed Lafayette Loop highway right-of-way (Gulf South Research Institute 1976). Site 16LY72 was described as a surface midden of historic artifacts situated within Section 68 of Township 10S, Range 4E; its overall size was not reported. Pedestrian survey resulted in the collection of unspecified quantities of historic ceramic sherds and glass shards. While the occupation date was undetermined, the associated assemblage suggested that the site represented the former location of a residential structure. Gulf South Research Institute (1976) did not assess the significance of Site 16LY72; however, archival research and monitoring of the site during proposed highway construction were recommended.

Site 16LY73 also was described as an historic period artifact scatter surrounding the former location of a residential structure. The site was identified within Section 68 of Township 10S, Range 4E, but Gulf South Research Institute (1976) did not note the overall size of the scatter. Pedestrian survey resulted in the collection of unspecified quantities of historic period ceramic sherds, glass shards, brick, and metal fragments. It was suggested that Site 16LY73 possibly represented a mid nineteenth century occupation. The eligibility of the site was not assessed; Gulf South Research Institute (1976) recommended that Site 16LY73 be monitored during proposed construction, and that archival research also be completed.

Site 16LY76, located within Section 93 of Township 9S, Range 5E, was described as a historic period surface scatter of unknown size. An assemblage consisting of unreported quantities of historic period ceramic sherds, glass shards, brick, and a single bone button was recovered during pedestrian survey. While a possible date of occupation was not determined, Gulf South Research Institute (1976) suggested that Site 16LY76 represented the former location of a residential structure. The National Register eligibility of Site 16LY76 was not assessed, but archival research to determine a date of occupation for the site was recommended.

Site 16LY77 also was identified as the former location of a residential structure located within Section 69 of Township 10S, Range 4E. The overall size of the site was not reported. Pedestrian survey of the area resulted in the collection of unspecified quantities of historic period ceramic sherds, glass shards, brick, coal, and oyster shells. No date of occupation was suggested by Gulf South Research Institute (1976), and the site was not assessed applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]). Monitoring of Site 16LY77 during proposed construction, as well as additional archival research, were recommended.

Site 16LY78 was identified within Section 69 of Township 10S, Range 4E. The site was described as a surface scatter of

historic period artifacts; the overall size of the site was not noted. Gulf South Research Institute (1976) stated that pedestrian survey resulted in the collection of unspecified quantities of historic period ceramic sherds and glass shards; a single fork and two bricks also were recovered from the surface of the site. Although the cultural affiliation of Site 16LY78 was not reported, it was suggested that the site represented the former location of a residential structure. Gulf South Research Institute (1976) did not assess the significance of Site 16LY78, but they recommended completion of archival research, and site monitoring during proposed construction.

Site 16LY80, recorded by Chip McGimsey during September of 1996, was identified as the historic period Frenchmen's Creek Cemetery. Located within Section 80 of Township 10S, Range 4E, the cemetery was identified during residential development. According to McGimsey, the dimensions of the cemetery were approximately 75 x 100 m (246.1 x 328.1 ft). While pedestrian survey resulted in the observation of an unspecified number of marked graves, it also was noted that construction already had occurred within the western portion of the cemetery. The cemetery appeared to date from at least the mid nineteenth century. This site was not assessed applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]), and no recommendations concerning additional testing of Site 16LY80 were noted on the State of Louisiana Site Record Form.

Site 16LY96 was recorded in 1998 by Cynthia Whitley, within Section 141 of Township 9S, Range 5E, during a Phase I cultural resources survey and archeological inventory of Lafayette Memorial USARC property (Parsons Engineering Science, Inc. 1998). Site 16LY96 was described as a subsurface scatter of historic period artifacts. Pedestrian survey augmented by shovel testing resulted in the collection of 6 historic period ceramic sherds, 2 glass shards, 1 earthenware drainpipe sherd, 1 wire nail, and 1 oyster shell fragment. All of the artifacts were recovered from depths ranging between 22 – 80 cmbs (8.7 – 31.5 inbs). Parsons Engineering Science, Inc. (1998) suggested that Site 16LY96 possibly represented a mid to late nineteenth century occupation. Site 16LY96 was assessed as not significant, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]), and no additional testing was recommended.

Site 16LY99 was recorded by Katherine Roberts in 1999. The site, which was situated within Section 81 of Township 10S, Range 5E, was identified during a Phase I cultural resources survey and archeological survey of a proposed flood wall construction area situated adjacent to the right descending bank of the Vermilion River within the city of Lafayette (Roberts 2000). The site was described as a subsurface scatter of prehistoric period artifacts. Auger testing throughout the proposed project area resulted in the collection of 13 Baytown Plain, *var. unspecified* prehistoric period ceramic sherds; 2 possible Baytown Plain, *var. Marksville* prehistoric period ceramic sherds; 1 unidentified projectile point/knife; and 1 early stage preform. Roberts (2000) did not report the depths from which these cultural materials were recovered. Site 16LY99 appeared to represent early Marksville and Coles Creek periods of occupation, and the site was assessed as potentially significant, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]). Roberts (2000) recommended that additional testing of Site 16LY99 be completed prior to construction of the proposed flood wall.

St. Martin Parish. Site 16SM15 was described as a scatter of prehistoric and historic artifacts situated within Section 33 of Township 9S, Range 5E. The site was recorded in 1976 by Beecher, Peny, and Staub; however, it previously had been identified in 1975 by the University of Southwestern Louisiana during a Phase I cultural resources survey and archeological inventory of Bayou Teche, Vermilion River, and Freshwater Bayou (Gibson 1975). The site reportedly represented the remains of

several prehistoric mounds that previously had been destroyed. Beecher, Peny, and Staub also noted that the remains of an unknown number of historic period structures were present at the site. The overall size of Site 16SM15 was not reported. According to Gibson (1975), pedestrian survey produced a collection of 296 Tchefuncte Plain prehistoric period ceramic sherds; 1 Tchefuncte Stamped, *var. Vermilion* prehistoric period ceramic sherd; 1 Tchefuncte Incised, *var. Tchefuncte* prehistoric period ceramic sherd; 1 Tchefuncte Incised, *var. Pontchartrain* prehistoric period ceramic sherd; 4 Lake Borgne Incised, *var. Lake Borgne* prehistoric period ceramic sherds; and 4 other pieces of baked clay.

The data presented on the State of Louisiana Site Record Form indicated that several test units had been excavated at Site 16SM15 by an unspecified party at an unknown date. While the quantity and size of these units was not reported, the form noted that unspecified quantities and types of prehistoric period lithics (including projectile points/knives and flakes) and ceramic sherds had been recovered. While the artifact assemblage suggested that the prehistoric component present at Site 16SM15 represented a Tchefuncte occupation, no date estimate was reported for the historic period component. Site 16SN15 was not assessed applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]); however, Gibson (1975) recommended additional testing of the site.

Site 16SM18 was recorded by Edwin B. Doran, Jr., during May 1941. The site, located within Section 33 of Township 9S, Range 5E, was described as two prehistoric mounds and an associated village located within a cultivated field. The overall size of the site was not reported; however, it was noted that one of the mounds measured 2.5 m (8 ft) in height by 12.2 m (40 ft) in diameter, while the second mound reportedly measured only 0.3 m (1 ft) in height by 6.1 m (20 ft) in diameter. A pedestrian survey of the site area reportedly was completed, but no information as to what, if any, cultural materials were collected was noted on the State of Louisiana Site Record Form. Doran suggested that Site 16SM18 could represent a Tchefuncte period occupation. No recommendations concerning additional testing of the site were noted on the State of Louisiana Site Record Form.

It should be noted that Gulf South Research Institute (1976) suggested that Sites 16SM15 and 16SM18 actually represented portions of a single site. Although Gulf South Research Institute (1976) apparently did not conduct a field examination of Site 16SM18, the authors recommended that the site be tested prior to construction of the proposed Lafayette Loop highway.

Site 16SM20 also was recorded in 1941 by Doran, who described the site as a prehistoric mound and village situated within Section 19 of Township 9S, Range 5E. Gibson (1975) conducted a pedestrian survey of the site area in 1975, but he was not able to locate the mound reported by Doran. However, his pedestrian survey produced a collection of 288 prehistoric period ceramic sherds (including Lake Borgne Incised, Tammany Punctated, Tchefuncte Incised, Jaketown Simple Stamped, and Pontchartrain Check Stamped); 24 complete Poverty Point objects; 126 Poverty Point object fragments; 35 fragments of baked clay; 3 unidentified projectile points/knives; 2 projectile point/knife fragments; 1 hematite plummet; 1 drill; 16 lithic flakes; 2 pieces of lithic shatter; and 1 calcined bear tooth. Two historic period pearlware sherds also were recovered. Site 16SM20 reportedly measured 900 m^2 (9,687.8 ft^2); however, Gibson (1976) suggested that the artifact scatter had been exposed by dredging of Ruth Canal. Although Gibson (1976) suggested that Site 16SM20 represented the Poverty Point and Tchefuncte periods of occupation, the National Register eligibility of the site was not assessed. Gibson (1975) recommended that additional testing of Site 16SM20 be conducted.

Chip McGimsey completed a State of Louisiana Site Record Update Form in August, 1995, reporting the results of a visit made to Site 16SM20 during the Summer of 1995. McGimsey noted that the site area was covered in dense vegetation and that dredge

spoil from the Ruth Canal had been piled on the reported location of Site 16SM20. A pedestrian survey of the area failed to identify any artifacts. McGimsey did not assess the significance of Site 16SM20, but he also recommended additional testing of the site.

Site 16SM81, situated within Section 19 of Township 9S, Range 5E, also was identified during August 1995 by Chip McGimsey, who discovered the site while conducting the pedestrian survey of previously recorded Site 16SM20. Site 16SM81 was described as a possible prehistoric mound that measured approximately 1 m (3.3 ft) in height by 30 m (98.4 m) in diameter. Pedestrian survey resulted in the collection of a single, possibly Marksville Stamped prehistoric ceramic sherd from an animal burrow back dirt pile. In addition, a single soil core was excavated on the northwestern side of the possible mound. McGimsey suggested that Site 16SM81 represented a possible Marksville period occupation. Site 16SM81 was assessed as potentially significant, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]); however, McGimsey noted that his evaluation was valid only if the site actually represented a prehistoric mound. Additional testing to evaluate the nature of Site 16SM81 was recommended.

Vermilion Parish. Site 16VM126 was recorded by Jon Gibson in 1976. The site, which was situated within Section 32 of Township 10S, Range 4E, was identified during a Phase I cultural resources survey and archeological inventory of Bayou Teche, Vermilion River, and Freshwater Bayou during May and June of 1975 by the University of Southwestern Louisiana (Gibson 1975). The site was described as a surface scatter of prehistoric artifacts, but the overall size of the site was not noted. Pedestrian survey resulted in the recovery of 5 unidentified prehistoric ceramic sherds, 1 unidentified projectile point/knife, and two modern 30 cal bullets. Gibson (1975) suggested that Site 16VM126 represented a possible Coles Creek or Plaquemine period occupation. Site 16VM126 was not assessed applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]), but additional testing of the site was recommended.

National Register of Historic Places Listed Properties which are Located Within 1.6 km (1 mi) of the Currently Proposed Vermilion River RSS Project Area

A single National Register of Historic Places listed structure was identified within 1.6 km of the currently proposed Vermilion River RSS project area (Table 8). The Vermilion Inn is situated at 1304 Pinhook Road within the City of Lafayette, Lafayette Parish, Louisiana, and it was placed on the National Register of Historic Places on July 13, 1983. According to information contained in the National Register nomination form, which was completed in April of 1983 by the National Register Staff of the Louisiana Division of Historic Preservation, the Vermilion Inn originally represented a ca. 1835 commercial structure. The building was described as a two-story, brick between posts Greek Revival style structure. The building reportedly served at one time as an inn and may have been occupied by Union troops during the Battle of Vermilion Bayou, which took place in October of 1863. The Vermilion Inn was considered significant on a local level in the area of architecture, because it represented an excellent example of the Greek Revival style within Lafayette Parish.

Previously Recorded Shipwrecks Located within 1.6 km (1 mi) of t7he Vermilion River RSS Project Area

As a part of this review, a search of *A Database of Louisiana Shipwrecks* (Clune and Wheeler 1991) located at the Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, Division of Archaeology, Baton Rouge, was conducted. This examination identified a total of four vessels known to have sunk within 1.6 km (1 mi) of the currently proposed Vermilion River RSS project area.

Table 8. Historic Standing Structure Located within 1.6 km (1 mi) of the Currently Proposed Vermilion River RSS Project Area that Appears in the National Register of Historic Places.

Name	USGS 7.5' Quadrangle	Address	Type	Architectural Style	Year Listed
Vermilion Inn	Lafayette, La.	1304 Pinhook Rd. Lafayette, La.	Commercial	Greek Revival	1983

These four boats were reportedly named the *Georgia;* the *Gretna;* the *Lillian;*and the *Assumption*. These watercraft reportedly were lost between 1842 and 1924 as a result of various causes, such as fire, explosion, and breaching. No information regarding the possible significance of any of these vessels was noted in *A Database of Louisiana Shipwrecks* (Clune and Wheeler 1991).

CHAPTER V

RESEARCH METHODOLOGY

Archival Investigations

Archival research concerning the history of the Vermilion River project area focused primarily on determining the historic use of the survey area, its relationship to waterborne transportation within this section of the Louisiana riverine and coastal system, and on identifying specific vessel losses reported near or within the project area. To accomplish this task, the archives at a number of institutions and collections were consulted, and shipwreck data were obtained through sources including the State of Louisiana Shipwreck Database (Department of Culture, Recreation, and Tourism, Division of Archeology), the U.S. Army Corps of Engineers shipwreck database (USCE Planning Division, New Orleans District), and the Automated Wreck and Obstruction Information System (AWOIS) of the National Oceanic and Atmospheric Administration (NOAA). Additional shipwreck data were obtained from published secondary sources, specifically Berman's *Encyclopedia of American Shipwrecks* (Berman 1972), Way's *Packet Directory* (Way 1994), and Lytle and Holdcamper's *Merchant Steam Vessels of the United States, 1790-1868* (Lytle and Holdcamper 1975).

Archeological Investigations

The Vermilion River marine remote sensing survey was conducted from the 24-ft research vessel *Coli*. The *Coli* was leased from the Louisiana Universities Marine Consortium (LUMCON), and captained by LUMCON's Mr. Samuel LeBouef. The project area consisted of nine survey blocks, each of which was divided between one and three parallel track lines spaced at 50 ft intervals. Eight survey blocks measured approximately 10,560 ft by 132 ft; the last block measured 7,920 ft by 132 ft. A total of 17.5 linear miles, or about 281.3 acres, were surveyed.

The remote sensing survey was designed to identify specific magnetic or acoustic anomalies and/or clusters of anomalies that might represent potentially significant submerged cultural resources, such as shipwrecks. The natural and anthropogenic forces that form such sites typically scatter ferrous objects like fasteners, anchors, engine parts, ballast, weaponry, cargo, tools, and miscellaneous related debris across the river bottom. These objects normally can be detected with a marine magnetometer, side scan sonar system, and digital fathometer that record anomalous magnetic or acoustic underwater signatures that stand out against the ambient magnetic or visual field. Two critical elements in the interpretation of such anomalies, which may also result from natural or modern sources, are their patterns and, in the case of magnetic anomalies, their amplitude and duration. Because of the importance of anomaly patterning, accurate recording and positioning of anomaly locations is essential.

The equipment array used for the Vermilion River survey included a DGPS, a proton precession marine magnetometer, a side scan sonar, and a digital fathometer (Figure 31). Data were collected and correlated via a laptop computer using hydrographic survey software.

Positioning

A Differential Global Positioning System (DGPS) was used during the Vermilion River marine remote sensing survey to direct navigation and supply accurate positions of magnetic and acoustic anomalies. The DGPS system consisted of a Northstar 941XD with internal DGPS. The Northstar 941XD transmitted position information in NMEA 0183 code to the computer navigation system (Version 7.4 of Coastal Oceanographics' *Hypack* software). *Hypack* translates the NMEA message and displays the survey vessel's position on a computer screen relative to the pre-plotted track lines. During post-processing, *Hypack's* positioning files can be utilized to produce track plot maps and to derive the X, Y, and Z values used to produce magnetic and bathymetric contour plot maps. For the Vermilion River marine remote sensing survey, positioning control points were obtained continuously by *Hypack* at one-second intervals. During the course of the survey, strong differential signals were acquired, with a minimum noise to signal ratio.

Magnetometry

The recording proton precession marine magnetometer is an electronic instrument used to record the strength of the earth's magnetic field in increments of nanoTeslas or gammas. Magnetometers have proven useful in marine research as detectors of anomalous distortions in the earth's ambient magnetic field, particularly distortions that are caused by concentrations of naturally occurring and/or manmade ferrous materials. Distortions or changes as small as 0.5 gammas are detectable when operating the magnetometer at a sampling rate of one second. Magnetic distortions caused by shipwrecks may range in intensity from several gammas to several thousand gammas, depending upon such factors as the mass of ferrous materials present, the distance of the ferrous mass from the sensor, and the orientation of the mass relative to the sensor. The uses of magnetometers in marine archeology and the theoretical aspects of the physical principals behind their operation are summarized and discussed in detail in Aitken (1961), Hall (1966, 1970), Tite (1972), Breiner (1973), Weymouth (1986), and Green (1990).

Individual anomalies produce distinctive magnetic "signatures." These individual signatures may be categorized as: 1) positive monopole; 2) negative monopole; 3) dipolar; or 4) multi-component (Figure 32). Positive and negative anomalies refer to monopolar deflections of the magnetic field, and usually indicate a single source. They produce either a positive or negative deflection from the ambient magnetic field, depending on how the object is oriented relative to the magnetometer sensor and whether its positive or negative pole is positioned closest to the sensor. Dipolar signatures display both a rise and a fall above and below the ambient field; they also are commonly associated with single source anomalies, with the dipole usually aligned along the axis of the magnetic field, and with the negative peak of the anomaly falling nearest the North Pole.

Especially important for archeological surveys are multi-component anomalies. Multi-component or complex signature anomalies consist of both dipolar and monopolar magnetic perturbations associated with a large overall deflection that can be indicative of the multiple individual ferrous materials comprising the debris patterns typically associated with shipwrecks. The complexity of the signature is affected partially by the distance of the sensor from the debris, and by the quantity of debris. If the sensor is close to the wreck, the signature will be multi-component; if far away, it may appear as a single source signature.

A Geometrics G866 proton precession marine magnetometer was used to complete the magnetic survey of the Vermilion River project area. The G866 is a 0.1 gamma sensitivity magnetometer that downloads magnetic data in digital format as numeric data files in *Hypack*. As the magnetic data are being collected, *Hypack* attaches the precise real-time DGPS coordinates to each magnetic reading, thus ensuring precise positioning control. The magnetometer was

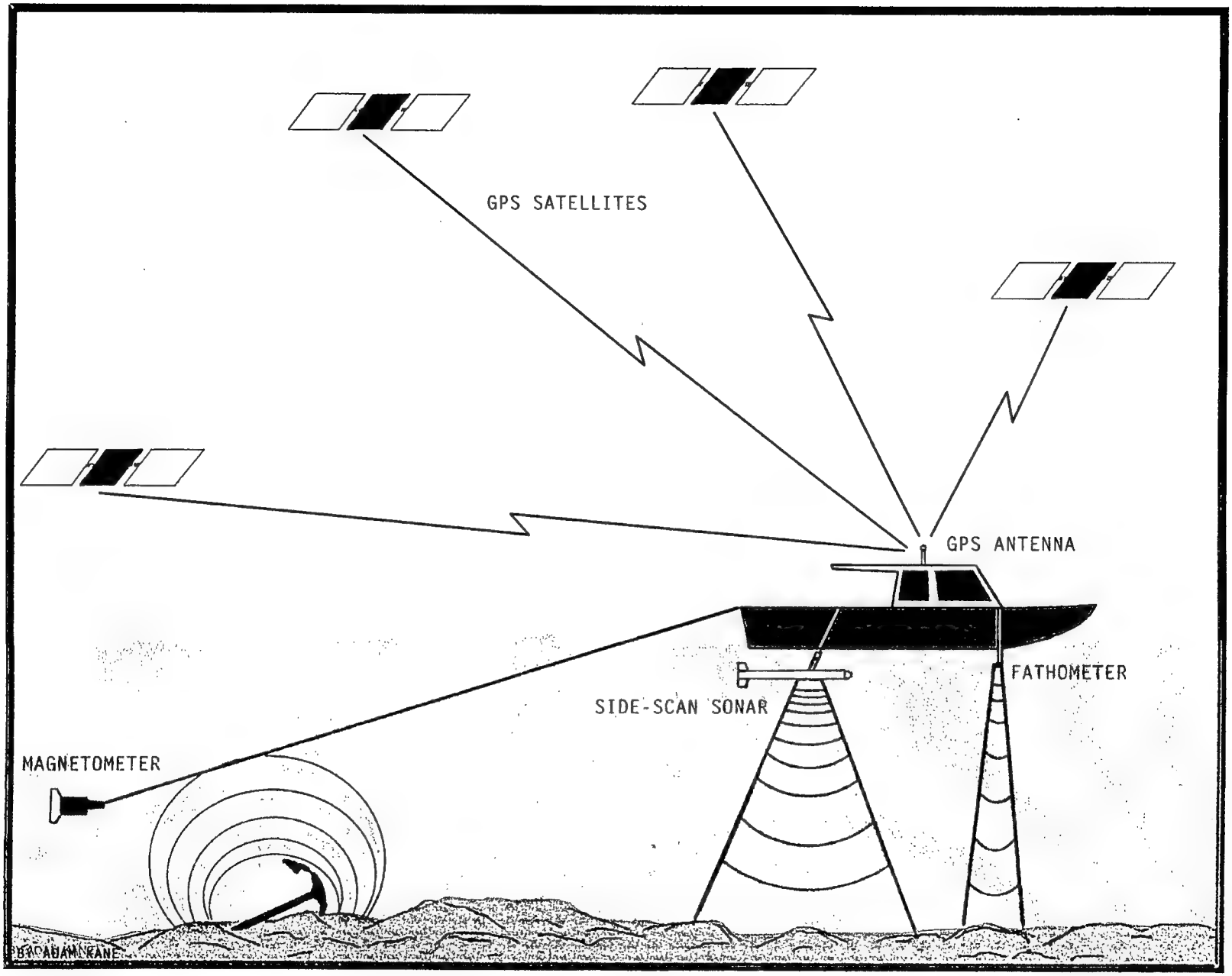

Figure 31. Drawing showing array of remote sensing and positioning equipment utilized during the Vermilion River survey

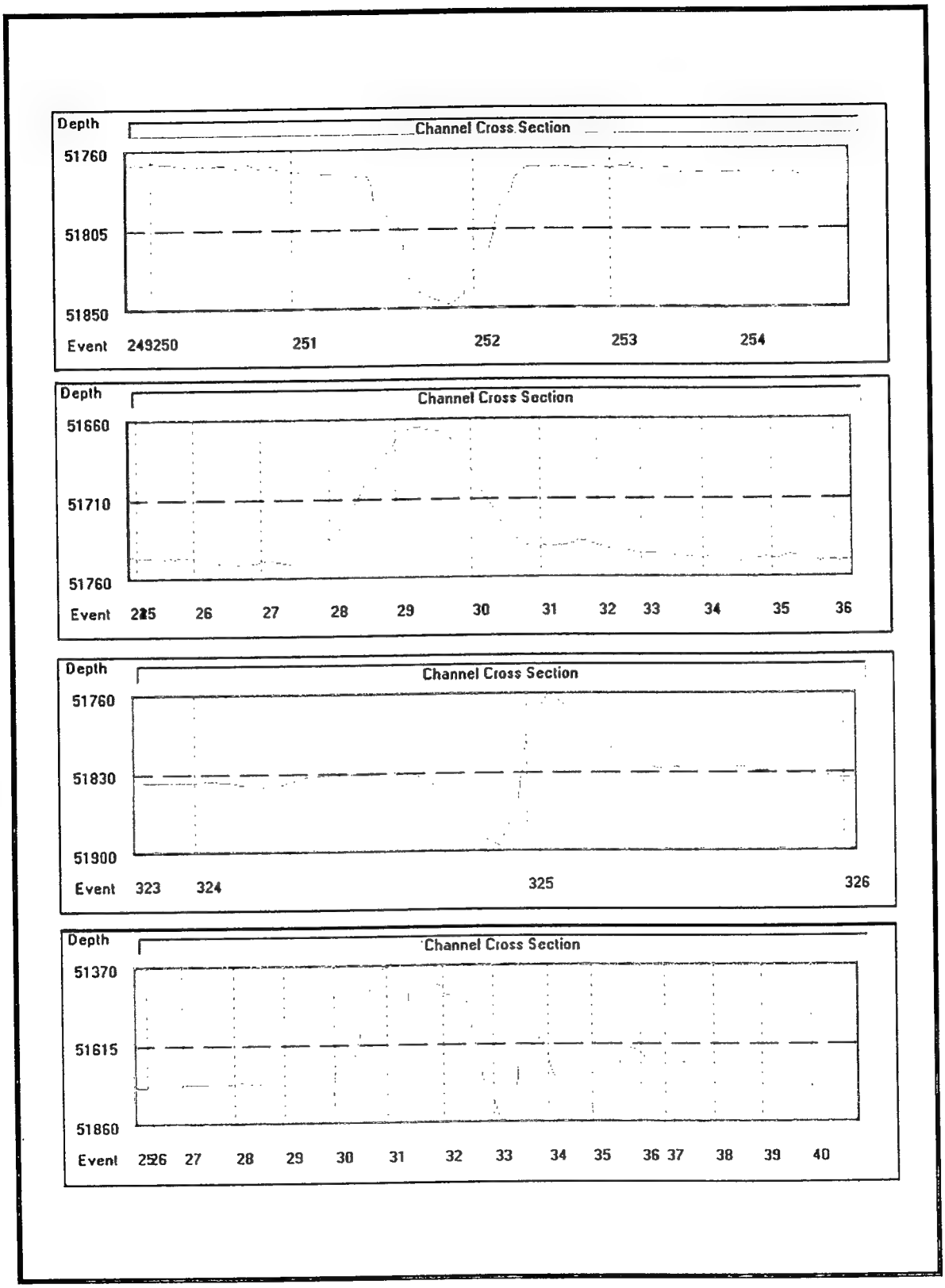

Figure 32. Magnetic Signatures: Positive Monopole, Negative Monopole, Dipole, and Multi-Component

towed far enough behind the survey vessel to minimize associated noise, which generally measured less than two gammas. A float was attached to the magnetometer sensor, so that a consistent depth below the water's surface could be maintained.

Acoustic Imaging

Over the past 25 years, the combined use of acoustic (sonar) and magnetic remote sensing equipment has proven to be the most effective method of identifying submerged cultural resources and assessing their potential for further research (Hall 1970; Green 1990). When combined with magnetic data, the near photographic-quality acoustic records produced by side scan sonar systems have left little doubt regarding the identifications of some targets as intact shipwrecks (Figure 33). For targets lacking structural integrity or those partially buried beneath bottom sediments, identification can be extremely difficult. Because intact and exposed wrecks are less common than broken and buried wrecks, remote sensing surveys generally produce acoustic targets that require ground-truthing by divers to determine their identification and historic significance.

An Imagenex color imaging digital side scan sonar system was utilized continuously during the Vermilion River survey to produce sonograms of the river bottom on each transect within the project area. The Imagenex system consisted of a Model 858 processor coupled with a Model 855 dual transducer tow fish operating at a frequency of 330 KHz. The sonar was set at a range of 90 ft per channel, which yielded overlapping coverage of the study areas. Sonar data were recorded in a digital format on an Iomega 1GB Jazz Drive. A stream of time-tags was attached continuously to the sonar data to assist in post-processing correlation of the acoustic and magnetic data sets. Additional latitude and longitude information from the DGPS was recorded onto the acoustic record. Acoustic images were displayed on a VGA monitor as they were recorded during the survey, and an observation log was maintained by the sonar technician to record descriptions of the anomalies and the times and locations associated with each target. Potential targets were inventoried during both the survey and post-processing.

The methodology employed during the survey produced favorable results, with reliable DGPS signals, low noise levels on the magnetometer, and clear acoustic images. All positioning and remote sensing equipment performed reliably throughout the survey. Regular and evenly spaced coverage of the entire survey area was achieved.

Survey Control and Correlation of Data Sets

The *Hypack* survey software provided the primary method of control during the survey. Survey lanes were planned in *Hypack*, geodetic parameters were established, and instruments were interfaced and recorded through the computer software. During the survey, the planned survey lines were displayed on the computer screen, and the survey vessel's track was monitored. In addition to providing steering direction for the helmsman, *Hypack* allowed the surveyors to monitor instruments and incoming data through additional windows on the survey screen.

All remote sensing data were correlated with DGPS positioning data and time through *Hypack*. Positions for all data then were corrected through the software for instrument layback and offsets. Positioning was recorded using Louisiana South State Plane grid coordinates, referencing the 1983 North American Datum (NAD-83). The GRS-1980 ellipsoid was used, along with a Lambert projection.

Remote Sensing Data Analysis

Magnetic and acoustic data were analyzed in the field while they were generated, and post-processed using *Hypack* and Autodesk's *AutoCAD* (Version 14) computer software applications. These computer programs were used to evaluate the signature, intensity, and duration of individual magnetic disturbances, and to plot their positions within the project area.

In the analysis of magnetometer data for the Vermilion River survey, individual anomalies were identified and carefully examined. First, the profile of each anomaly was characterized in terms of pattern, amplitude, and duration. Magnetic data were correlated with field notes, so that deflections from modern sources, such as channel markers, could be identified. Although all anomalies with an amplitude greater than ten gammas were given a magnetic anomaly number for reference purposes and tabulated, anomalies of larger amplitude (more than 50 gammas) and of longer duration (more than 20 seconds) generally are considered to have a higher likelihood of representing possible shipwreck remains, especially when such anomalies cluster together.

Side scan sonar data were examined for anomalous acoustic targets and shadows that might represent potentially significant submerged cultural resources; correlations were made with any magnetic or bathymetric anomalies, and significant targets were determined.

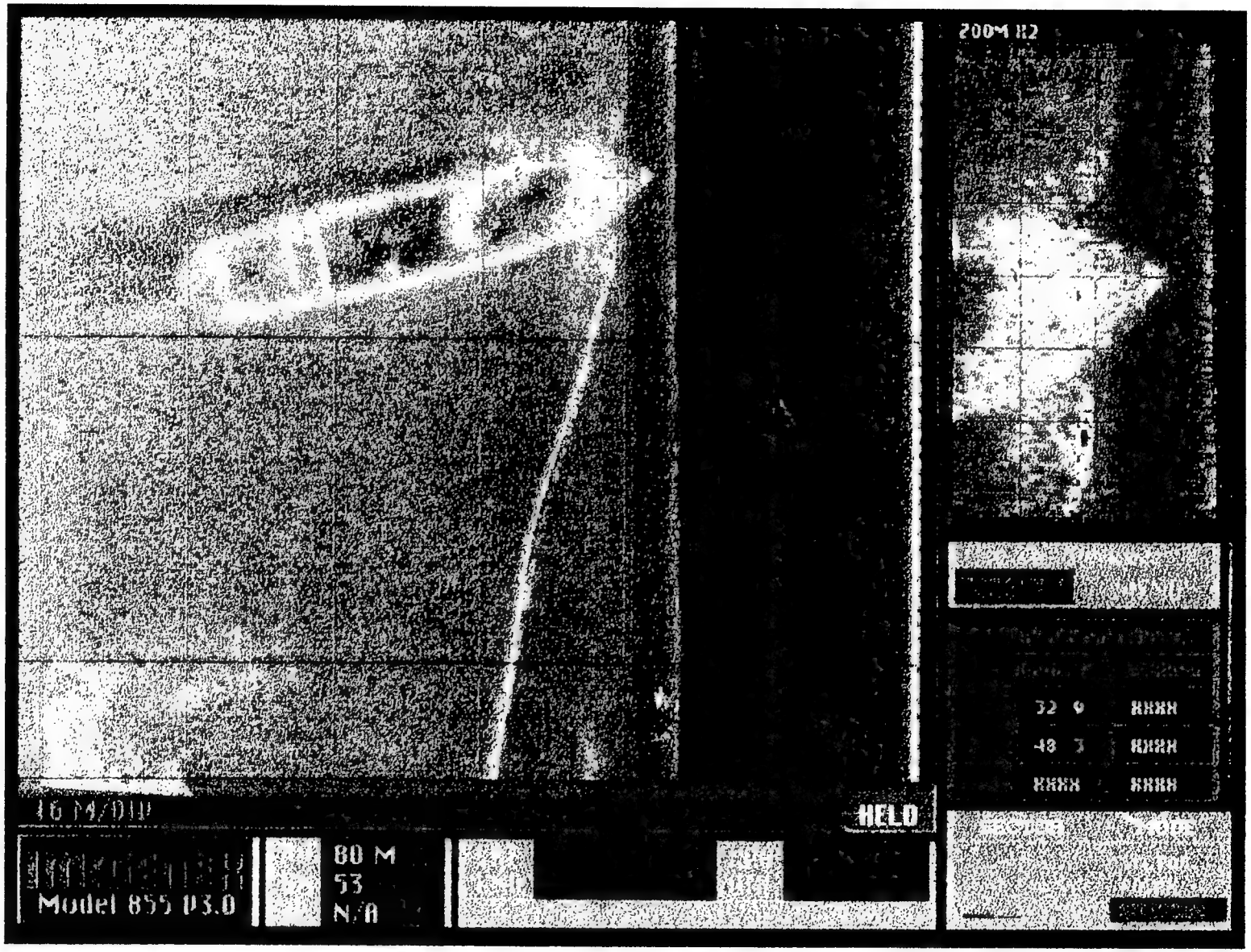

Figure 33. An acoustic image example of an intact shipwreck

CHAPTER VI

RESULTS

During this marine remote sensing survey conducted for the USACE, New Orleans District, approximately 296 major magnetic anomalies were recorded (Table 9), and 43 large acoustic anomalies were detected (Table 10) along the Vermilion River. During the data collection phase of the Vermilion River project, it was realized that hundreds of very small magnetic deflection anomalies, below ten (10) gammas with a duration of less than five (5) seconds, were present. While these low-level magnetic anomalies were examined for patterning that could be representative of disarticulated vessels or other significant cultural resources, these anomalies were not counted as major magnetic anomalies due to their short duration and low amplitude magnetic signatures. Additionally, the patterning of these low-level magnetic anomalies indicates that they are single point sources of small metallic debris. From these anomalies, 60 targets were identified (Table 11) (Figure 3a-i), largely consisting of bridges, pipelines, cables, bulkheads, and debris (Appendix II – Built Resources). A number of smaller magnetic and acoustic anomalies also were detected; these were determined to be modern debris. The large quantity of debris was expected, due to the twentieth century history of the Vermilion River and its banks.

Shipwrecks

As indicated in Chapter III, four shipwrecks had been recorded within the project area, near Bayou Tortue and Broussard Bridge (Table 12); one ferry crossing also was located at the present location of the Broussard. Special attention was given to data from these areas while evaluating anomalies that could represent either the ferry landing or vessel remains. In examining the remote sensing data within the study area where shipwrecks had been reported, the data were analyzed using three analytical techniques: contour plots, three-dimensional magnetic surface plots, and point plots. Additionally, bathymetric data were plotted in correlation with the magnetic data to enhance recognition of any magnetic perturbation that could represent a cultural resource. Analysis and examination of the survey data indicated that none of the identified targets within the blocks where wrecks were reported represented or constituted these historic shipwrecks. It is probable that dredging and snag removal operations during the past two centuries removed any wrecks in the study area on the Vermilion River; moreover, the massive flooding that occurred in 1927 and 1940 no doubt contributed to the scattering or destruction of any ship remains in the Vermilion River.

Bridges

The survey area incorporates 17.5 miles of the Vermilion River that runs through the middle of the City of Lafayette. Ten bridge structures and railroad trestles are located in the survey area, which extends from the

Table 9. Table of Magnetic Anomalies Identified During Remote Sensing Survey

Anomaly No.	Line No.	Start Time	End Time	Duration (seconds)	Gamma	Signature	NAD 83 (ft) X	NAD 83 (ft) Y	Note	Correlation (Mag/acoustic)
Block 1										
M1	1	13:57:40.1	13:58:30.0	00:49.9	44543	D	3044819.5	584030.0	debris and Milton Bridge	M8, M23,A11
M2	1	13:59:12.3	13:59:22.1	00:09.8	748.6	D	3044716.5	584386.2		
M3	1	14:01:34.2	14:02:34.1	00:59.9	204.2	MC	3044299.8	585175.9		
M4	1	14:06:10.1	14:06:44.2	00:34.1	85	MC	3042902.6	585600.9		
M5	1	14:08:54.2	14:09:46.2	00:52.0	438.2	+	3042227.9	586391.1	boat launch	M14
M6	1	14:11:12.3	14:12:06.0	00:53.7	436.8	MC	3041905.3	587074	gas pipeline	M15, A14
M7	1	14:18:04.3	14:18:17.9	00:13.6	125.8	-	3041291.2	589244.2	boat on surface	
M8	3	15:13:16.1	15:13:42.4	00:26.3	8020.6	D	3044834.7	584030.1	bridge and debris	M1, M23,A11
M9	3	15:12:34.6	15:12:44.4	00:09.8	42	+	3044761.3	584350.1	debris near bridge	
M10	3	15:12:26.4	15:12:34.6	00:08.2	51.6	+	3044743.2	584408.2	debris	
M11	3	15:12:06.1	15:12:16.5	00:10.4	74	+	3044730.4	584515.8		
M12	3	15:10:12.2	15:10:24.2	00:12.0	91.2	+	3044419.5	585142.9		
M13	3	15:08:24.1	15:09:46.4	01:22.3	105.8	MC	3043877.2	585382.8	metal bulkhead	M24
M14	3	15:03:14.1	15:04:04.5	00:50.4	72.2	+	3042261.3	586391.0	boat on surface	M5
M15	3	15:01:12.4	15:01:52.5	00:40.1	217	D	3041925.9	587167.4	Louisiana Gas System Pipeline	M6, A14
M16	3	15:00:26.4	15:01:02.6	00:36.2	348.6	+	3041815.9	587464.5	pipeline	M27, A7, A15
M17	3	14:56:04.4	14:56:18.2	00:13.8	68.6	D	3041368.8	589113.1		
M18	3	14:53:20.5	14:54:06.1	00:45.6	106.6	-	3041536.2	590048.5	pipeline	M29
M19	3	14:50:32.3	14:50:48.1	00:15.8	160.6	D	3042231.6	591074.8		
M20	3	14:49:08.5	14:49:48.5	00:40.0	333.2	-	3042555.7	591593.6		M31, A2
M21	3	14:47:00.0	14:47:10.5	00:10.5	38.4	-	3042987.8	592406.1		M32, A18
M22	3	14:45:36.4	14:45:50.1	00:13.7	42	D	3043446.4	592731.5		
M23	4	15:26:01.1	15:27:06.8	01:05.7	7934.2	D	3044844.0	584038.8	bridge and debris	M8, M1,A11
M24	4	15:30:42.8	15:32:02.9	01:20.1	162.4	MC	3043875.0	585404.9	metal bulkhead	M13
M25	4	15:33:29.0	15:33:41.0	00:12.0	55.8	+	3043148.5	585595.6	boat launch	
M26	4	15:38:55.2	15:39:13.3	00:18.1	174	+	3041927.2	587234.4		
M27	4	15:39:27.1	15:40:01.2	00:34.1	775.8	+	3041864.1	587471.5	Louisiana and Shell pipelines	M16, A7, A15
M28	4	15:44:17.1	15:44:29.1	00:12.0	24.4	D	3041382.5	589128.8	very noisy bottom	
M29	4	15:46:33.2	15:47:04.9	00:31.7	50.6	D	3041592.8	590079.8	gas pipeline	M18
M30	4	15:47:31.1	15:47:45.4	00:14.3	23.8	+	3041728.1	3041728.14		
M31	4	15:51:13.2	15:51:54.9	00:41.7	365.6	-	3042560.8	591600.9	debris	M20, A2
M32	4	15:53:55.3	15:54:13.4	00:18.1	39.2	D	3042996.0	592401.5		M21, A18

Anomaly No.	Line No.	Start Time	End Time	Duration (seconds)	Gamma	Signature	NAD 83 (ft) X	NAD 83 (ft) Y	Note	Correlation (Mag/acoustic)
Block 2										
M33	1	10:20:44.2	10:20:57.9	00:13.7	43292.4	-	3044172.0	593087.9	Columbia Gulf Transmission Pipeline	M46, M53
M34	1	10:23:40.2	10:23:58.3	00:18.1	24.2	D	3044962.6	593808.6	bulkhead	
M35	1	10:29:51.8	10:30:02.2	00:10.4	261	D	3045640.5	595971.7	bulkhead and pipeline	
M36	1	10:30:53.9	10:31:11.9	00:18.0	688.4	D	3045516.6	596388.5	bulkhead and pipeline	M49, M63
M37	1	10:31:34.3	10:31:40.3	00:06.0	97.2	D	3045472.8	596568.6		
M38	1	10:33:10.3	10:34:44.0	01:33.7	16862.2	MC	3045733.4	597414.8	Acadiana Shell and Sand barge	M50, M64, A21
M39	1	10:35:22.3	10:36:03.9	00:41.6	3964.2	D	3046068.4	597879.1	Eloi Broussard Bridge	M51, M65, A22
M40	1	10:40:38.4	10:41:16.2	00:37.8	1852.6	D	3046528.8	599585.2	debris	M48, M69, A23
M41	1	10:41:40.4	10:42:07.9	00:27.5	100.4	-	3046716.0	599812.1	Texas Gas Corp. Pipeline	A25
M42	1	10:43:56.2	10:44:26.3	00:30.1	26	MC	3047370.4	600069.5	debris	
M43	3	11:18:24.0	11:18:32.2	00:08.2	41	-	3042971.2	592373.1		
M44	3	11:17:32.5	11:17:44.5	00:12.0	36.6	MC	3043221.2	592581.7		
M45	3	11:16:34.3	11:16:44.2	00:09.9	26.8	D	3043561.7	592809.7		
M46	3	11:14:42.3	11:15:20.1	00:37.8	4560.6	D	3044176.7	593036.6		M33, M53
M47	3	11:09:08.3	11:09:22.0	00:13.7	67.2	D	3045328.5	594630.4		
M48	3	11:05:28.1	11:06:14.2	00:46.1	102.6	MC	3045722.0	595801.2		M40, M69, A23
M49	3	11:04:06.4	11:04:40.4	00:34.0	173.8	D	3045640.4	596348.7	debris	M36, M63
M50	3	11:00:38.4	11:02:06.0	01:27.6	93.6	-	3045827.0	597414.4	bulkhead	M38, M64, A21
M51	3	10:59:22.4	11:00:08.3	00:45.9	5922.6	D	3046106.5	597720.3	Eloi Broussard Bridge	M39, M65, A22
M52	3	10:56:40.2	10:57:16.4	00:36.2	66.4	MC	3046320.0	598822.1	Texas Gas Corp. Pipeline	M63
M53	3	10:54:40.1	10:55:32.2	00:52.1	1087.4	-	3046591.0	599450.9	bulkhead and barge on surface	M33, M46
M54	3	10:51:12.0	10:51:42.1	00:30.1	40.2	MC	3047686.4	599877.3	debris	
M55	4	11:21:20.4	11:21:32.4	00:12.0	32.6	+	3043005.5	592324.4		
M56	4	11:22:48.1	11:23:14.3	00:26.2	173.4	D	3043452.3	592689.9		
M57	4	11:24:40.2	11:24:56.1	00:15.9	1103.2	+	3044033.9	592959.7	pipeline	A24
M58	4	11:25:06.5	11:25:26.2	00:19.7	8922.2	-	3044191.5	593006.4		
M59	4	11:27:34.5	11:27:52.1	00:17.6	61.4	D	3044860.8	593505.6		
M60	4	11:31:38.3	11:32:02.4	00:24.1	269.6	-	3045446.5	594806.2	metal bulkhead	
M61	4	11:32:20.5	11:32:44.1	00:23.6	74.6	MC	3045519.9	595020.9		
M62	4	11:33:26.3	11:33:38.4	00:12.1	131.6	MC	3045656.5	595364.3		
M63	4	11:36:18.5	11:36:54.6	00:36.1	284.8	D	3045627.5	596351.6		M36, M49
M64	4	11:38:00.3	11:40:40.6	02:40.3	635.4	-	3045887.4	597402.2	barge on surface	M38, M50, A21
M65	4	11:40:58.2	11:41:38.2	00:40.0	6231.6	D	3046154.5	597678.7	Eloi Broussard Bridge	M39, M51, A22

Anomaly No.	Line No.	Start Time	End Time	Duration (seconds)	Gamma	Signature	NAD 83 (ft) X	NAD 83 (ft) Y	Note	Correlation (Mag/acoustic)
M66	4	11:42:14.4	11:42:38.5	00:24.1	166.4	-	3046240.7	598144.4	submerged cable	
M67	4	11:43:30.2	11:43:42.2	00:12.0	31	D	3046300.2	598558.7		
M68	4	11:44:04.6	11:44:46.2	00:41.6	86.8	MC	3046326.4	598800.8	submerged cable	M52
M69	4	11:46:14.3	11:47:10.3	00:56.0	1149.4	MC	3046559.8	599529.4	Texas Gas Corp. Pipeline	M40, M48, A23
M70	4	11:48:42.2	11:49:04.7	00:22.5	705.8	D	3046995.1	600001.3	barge on surface	
M71	4	11:50:16.4	11:50:22.5	00:06.1	58.8	+	3047476.9	600027.2		
M72	4	11:50:34.6	11:50:44.5	00:09.9	351	-	3047558.7	599965.4		
M73	4	11:50:52.1	11:51:08.6	00:16.5	102.8	D	3047684.1	599903.9	debris	
Block 3										
M74	1	11:59:59.2	12:00:24.9	00:25.7	31.6	+	3048094.8	599394.2		
M75	1	12:01:41.0	12:01:55.2	00:14.2	28.2	+	3048515.7	599138.5	debris	
M76	1	12:02:23.3	12:02:34.8	00:11.5	69.2	-	3048767.1	599143.6		
M77	1	12:03:45.0	12:03:59.3	00:14.3	13	D	3049219.1	599294.5		
M78	1	12:04:19.1	12:04:56.8	00:37.7	25.6	-	3049473.6	599451.4		
M79	1	12:07:59.3	12:09:07.4	01:08.1	120.8	MC	3050474.4	600413.2		
M80	1	12:09:15.0	12:09:24.9	00:09.9	76	D	3050631.5	600510.3	metal bulkhead	
M81	1	12:09:45.2	12:10:37.3	00:52.1	43.2	+	3050843.0	600734.0		
M82	1	12:12:20.9	12:13:28.8	01:07.9	34.8	MC	3050965.0	601652.3		
M83	1	12:15:59.1	12:16:24.9	00:25.8	65.8	MC	3050233.3	602422.7	debris	M99
M84	1	12:18:12.9	12:18:27.2	00:14.3	44.6	D	3050037.6	603138.4		
M85	1	12:18:34.9	12:18:51.3	00:16.4	157.2	D	3049985.2	603243.2		
M86	1	12:19:51.0	12:22:01.0	02:10.0	231.8	D	3049980.6	604054.6	debris and bulkhead	M98, M113, A27
M87	1	12:23:39.3	12:24:23.2	00:43.9	147.6	D	3050245.6	605091.7	bulkhead	M95, M117
M88	1	12:25:15.3	12:26:11.2	00:55.9	55	-	3050584.9	605314.0		M118
M89	1	12:27:44.9	12:28:21.0	00:36.1	52.2	MC	3051454.7	605322.6		
M90	1	12:29:29.4	12:30:07.3	00:37.9	99.8	MC	3051982.6	605124.3	Sewage Treatment Plant	M91, M121
M91	2	12:34:23.4	12:34:35.4	00:12.0	219.8	+	3051982.6	605093.6	Sewage Treatment Plant	M90, M121
M92	2	12:36:03.2	12:36:21.2	00:18.0	308.2	MC	3051386.6	605284.7		M120
M93	2	12:37:01.2	12:37:14.9	00:13.7	111.6	D	3051043.0	605366.1		
M94	2	12:38:01.0	12:38:37.1	00:36.1	118.6	-	3050648.3	605287.1	debris	
M95	2	12:39:29.1	12:39:49.4	00:20.3	22.2	-	3050286.1	605068.8		M87, M117
M96	2	12:40:53.4	12:41:03.3	00:09.9	22	D	3050083.3	604612.3		
M97	2	12:41:19.2	12:41:29.1	00:09.9	31.8	D	3050100.1	604484.0		M115
M98	2	12:42:19.4	12:43:11.4	00:52.0	755.8	D	3050020.9	604031.9	dock and bulkhead	M86, M113, A27
M99	2	12:46:57.3	12:47:11.0	00:13.7	41.8	D	3050243.7	602434.4		M83

Anomaly No.	Line No.	Start Time	End Time	Duration (seconds)	Gamma	Signature	NAD 83 (ft) X	NAD 83 (ft) Y	Note	Correlation (Mag/acoustic)
M100	2	12:48:27.2	12:48:43.1	00:15.9	61	D	3050489.9	601997.6	bulkhead	
M101	2	13:00:57.1	13:01:03.1	00:06.0	71.2	+	3048319.4	599136.8		M102
M102	3	13:06:03.1	13:06:09.1	00:06.0	42	+	3048315.3	599129.2		M101
M103	3	13:06:41.4	13:06:55.7	00:14.3	39	D	3048537.2	599101.1		
M104	3	13:07:01.1	13:07:13.2	00:12.1	30.6	+	3048647.7	599089.0		
M105	3	13:07:53.3	13:08:17.4	00:24.1	50	D	3048961.8	599129.8		
M106	3	13:08:27.3	13:09:03.5	00:36.2	54.4	MC	3049149.2	599183.9		
M107	3	13:09:57.3	13:10:17.5	00:20.2	33.4	D	3049554.6	599435.0		
M108	3	13:11:25.5	13:11:33.2	00:07.7	24	+	3049877.2	599775.0		
M109	3	13:11:37.5	13:11:55.1	00:17.6	64.6	D	3049957.4	599860.8		
M110	3	13:15:27.6	13:15:37.5	00:09.9	40.8	D	3050909.9	600742.5		
M111	3	13:16:13.7	13:16:23.6	00:09.9	95	-	3051037.1	600971.1	bulkhead	
M112	3	13:19:29.4	13:20:13.2	00:43.8	21	MC	3050553.6	601987.5		
M113	3	13:25:35.5	13:26:37.3	01:01.8	1367.4	D	3050035.7	603982.2	barge on surface	M86, M98, A27
M114	3	13:26:51.5	13:27:17.3	00:25.8	115.2	D	3050082.7	604269.7	bulkhead	
M115	3	13:27:33.7	13:27:45.2	00:11.5	30.4	D	3050101.5	604469.6		M97
M116	3	13:28:03.3	13:28:15.3	00:12.0	20.4	D	3050092.6	604676.4		
M117	3	13:29:17.3	13:29:37.6	00:20.3	40	-	3050329.1	605083.7	bulkhead	M87, M95
M118	3	13:30:21.5	13:30:59.3	00:37.8	124.2	D	3050570.4	605275.3	boat on surface	M88
M119	3	13:32:31.4	13:32:43.4	00:12.0	162.6	D	3051296.4	605304.5		
M120	3	13:32:45.6	13:33:21.3	00:35.7	426	MC	3051382.1	605279.6		M92
M121	3	13:34:35.7	13:34:55.5	00:19.8	89.8	D	3052017.2	605129.1		M90, M91
Block 4										
M122	1	13:41:08.8	13:41:22.5	00:13.7	251.4	D	3052301.0	605215.8		
M123	1	13:41:42.7	13:42:32.6	00:49.9	5870.8	D	3052558.7	605367.9	Sewage Treatment Plant	M153, M154, A43
M124	1	13:43:18.7	13:43:26.4	00:07.7	143	-	3052799.0	605703.9		M152, M155
M125	1	13:47:18.8	13:47:38.5	00:19.7	1469.6	D	3052576.7	607049.9	bulkhead	M151, M156
M126	1	13:49:20.4	13:49:36.8	00:16.4	423	D	3052714.0	607693.9		M150
M127	1	13:49:58.8	13:50:42.6	00:43.8	608.2	MC	3052925.4	607926.5	bulkhead	M149, M157
M128	1	13:52:34.4	13:53:30.9	00:56.5	808	MC	3053863.2	608111.6	pipes and bulkhead	
M129	1	13:55:40.6	13:55:48.9	00:08.3	97.2	D	3054699.5	607790.9		
M130	1	13:56:10.8	13:56:22.8	00:12.0	29	+	3054890.5	607828.0		
M131	1	13:56:32.7	13:57:00.6	00:27.9	79	MC	3055036.1	607967.0		M147, M158
M132	1	13:58:38.8	13:58:52.5	00:13.7	82.2	D	3055126.9	608589.1	VERY NOISEY	
M133	1	14:01:50.6	14:02:08.7	00:18.1	133.2	D	3054439.8	609547.7		

Anomaly No.	Line No.	Start Time	End Time	Duration (seconds)	Gamma	Signature	NAD 83 (ft) X	NAD 83 (ft) Y	Note	Correlation (Mag/acoustic)
M134	1	14:06:28.9	14:06:42.6	00:13.7	275.6	D	3054301.8	611074.3	debris	
M135	1	14:08:41.0	14:09:27.0	00:46.0	48.2	MC	3054676.4	611836.2		
M136	1	14:10:12.5	14:10:30.5	00:18.0	70.4	D	3055056.7	612024.0		
M137	1	14:11:04.5	14:11:46.8	00:42.3	327.2	MC	3055456.3	611949.1	canal opening	
M138	2	14:17:00.8	14:17:04.6	00:03.8	116.6	+	3055502.4	611882.0	canal opening	
M139	2	14:17:10.6	14:17:26.5	00:15.9	92	MC	3055392.2	611933.1		
M140	2	14:20:59.1	14:21:15.0	00:15.9	205.2	MC	3054315.1	610995.6		M164
M141	2	14:21:27.0	14:21:34.7	00:07.7	167.4	D	3054295.4	610831.2	canal opening	
M142	2	14:21:56.5	14:22:20.7	00:24.2	118.2	MC	3054277.6	610552.8		M163
M143	2	14:22:32.7	14:22:47.0	00:14.3	30	MC	3054271.6	610340.8	caution buoy	M162
M144	2	14:26:49.0	14:27:08.6	00:19.6	48.2	D	3055025.0	608874.3		
M145	2	14:28:06.6	14:28:18.7	00:12.1	90.2	D	3055188.1	608419.8		M160
M146	2	14:28:36.7	14:28:44.9	00:08.2	81.6	D	3055179.8	608263.7		M159
M147	2	14:29:18.9	14:29:44.6	00:25.7	151	MC	3055037.2	607938.3	debris	M131, M158
M148	2	14:30:42.8	14:30:51.0	00:08.2	40.2	-	3054653.7	607751.5		
M149	2	14:35:07.1	14:35:35.1	00:28.0	1058.6	D	3052969.2	607920.6	Koch Gateway Pipeline	M127, M157
M150	2	14:35:57.0	14:36:15.1	00:18.1	200	MC	3052753.2	607704.8		M126
M151	2	14:37:39.0	14:37:53.2	00:14.2	896.6	MC	3052603.0	607076.8		M125, M156
M152	2	14:41:21.1	14:41:27.2	00:06.1	65	D	3052824.9	605684.9		M124, M155
M153	2	14:42:11.0	14:42:38.9	00:27.9	6,905.40	D	3052565.5	605381.5	Ambassador Caffery Bridge	M123, M154, A43
M154	3	14:46:25.1	14:47:00.7	00:35.6	7300.4	D	3052589.4	605382.4	Ambassador Caffery Bridge	M123, M153, A43
M155	3	14:47:51.2	14:48:07.1	00:15.9	179.6	D	3052859.1	605690.4	bulkhead	M124, M152
M156	3	14:52:07.0	14:52:25.1	00:18.1	595.2	MC	3052619.6	607069.5	bulkhead	M125, M151
M157	3	14:54:43.1	14:55:08.8	00:25.7	785	MC	3052975.2	607914.8	bulkhead	M127, M149
M158	3	15:00:55.0	15:01:19.0	00:24.0	208.4	MC	3055031.1	607923.2	pipes and bulkhead	M131, M147
M159	3	15:01:59.0	15:02:07.2	00:08.2	35	+	3055170.5	608247.9	debris	M146
M160	3	15:02:25.2	15:02:32.9	00:07.7	80.2	D	3055186.2	608417.8		M145
M161	3	15:07:08.9	15:07:15.0	00:06.1	48.4	+	3054324.7	609859.3		
M162	3	15:08:35.0	15:08:41.1	00:06.1	43	-	3054286.0	610321.4		M143
M163	3	15:09:06.8	15:09:24.9	00:18.1	157.2	MC	3054288.6	610570.9		M142
M164	3	15:10:03.3	15:10:38.9	00:35.6	607.4	MC	3054308.8	610984.4	canal opening	M140
M165	3	15:13:31.2	15:13:41.0	00:09.8	61.8	MC	3054764.6	611880.1		
M166	3	15:14:33.1	15:15:37.3	01:04.2	140.8	MC	3055265.7	611959.9		

Anomaly No.	Line No.	Start Time	End Time	Duration (seconds)	Gamma	Signature	NAD 83 (ft) X	NAD 83 (ft) Y	Note	Correlation (Mag/acoustic)
Block 5										
M167	1	09:14:39.8	09:14:59.6	00:19.8	100	-	3056666.0	611342.6	boat on surface	
M168	1	09:15:01.8	09:15:19.8	00:18.0	110.2	MC	3056748.9	611304.9	boat on surface	
M169	1	09:16:11.9	09:16:25.6	00:13.7	65.4	MC	3057138.7	611139.4		M188, M195
M170	1	09:18:48.0	09:19:07.8	00:19.8	60	+	3057904.1	610730.3		M187
M171	1	09:23:13.8	09:23:27.5	00:13.7	110	MC	3059010.8	611284.0		
M172	1	09:23:53.9	09:24:01.6	00:07.7	180.4	+	3059087.7	611474.5		
M173	1	09:25:47.9	09:26:27.9	00:40.0	55	MC	3059055.4	612225.3		
M174	1	09:26:46.0	09:27:47.9	01:01.9	78.2	MC	3058768.6	612542.1		
M175	1	09:28:55.9	09:29:17.9	00:22.0	55	D	3058289.0	612845.1		
M176	1	09:29:54.1	09:30:11.6	00:17.5	320.8	D	3058261.8	613158.3	drainage pipe	
M177	1	09:31:02.0	09:31:09.7	00:07.7	311.2	-	3058291.8	613514.3		M183, M203
M178	1	09:32:05.7	09:32:09.6	00:03.9	22872.8	-	3058390.0	613843.3		
M179	1	09:32:54.0	09:33:19.8	00:25.8	343	MC	3058679.2	614032.6	abandoned launch	
M180	1	09:34:19.6	09:34:25.7	00:06.1	35	+	3059087.4	614138.8		
M181	2	09:40:30.1	09:40:39.9	00:09.8	30	-	3058964.2	614038.1		
M182	2	09:42:36.0	09:42:54.1	00:18.1	115.2	MC	3058393.7	613694.9		
M183	2	09:43:19.8	09:43:37.9	00:18.1	170.4	+	3058310.2	613464.3		M177, M203
M184	2	09:44:14.1	09:44:54.0	00:39.9	35.6	MC	3058283.2	613113.7		
M185	2	09:47:19.8	09:47:35.7	00:15.9	294.4	D	3058941.4	612406.3		M201
M186	2	09:50:05.8	09:50:57.7	00:51.9	70	MC	3059175.4	611484.5		
M187	2	09:55:36.0	09:55:48.0	00:12.0	40.2	MC	3057877.6	610717.8		M170
M188	2	09:57:60.0	09:58:21.9	00:21.9	62.8	MC	3057064.7	611084.5		M169, M195
M189	2	09:59:45.7	09:59:57.7	00:12.0	158	MC	3056515.8	611382.4		M194
M190	2	10:01:28.1	10:01:35.8	00:07.7	52.2	-	3055992.7	611649.4		
M191	2	10:01:56.1	10:02:06.0	00:09.9	55	MC	3055848.3	611721.3		
M192	3	10:04:53.7	10:05:17.9	00:24.2	79.8	MC	3055751.6	611740.9	debris	
M193	3	10:05:42.0	10:06:12.1	00:30.1	40.8	MC	3056026.4	611594.6		
M194	3	10:07:39.8	10:07:50.1	00:10.3	318	D	3056518.8	611357.8		M189
M195	3	10:09:32.2	10:09:51.8	00:19.6	66.4	MC	3057116.3	611087.9		M169, M188
M196	3	10:10:49.9	10:11:10.2	00:20.3	40	MC	3057457.5	610908.0		
M197	3	10:11:54.0	10:12:03.8	00:09.8	71.4	+	3057701.4	610767.0		
M198	3	10:13:27.7	10:14:09.9	00:42.2	38.2	MC	3058205.2	610586.8		
M199	3	10:15:57.9	10:16:12.2	00:14.3	80.6	MC	3058890.4	610804.7	boat launch	
M200	3	10:18:12.0	10:18:46.0	00:34.0	48.8	MC	3059157.0	611552.0		

Anomaly No.	Line No.	Start Time	End Time	Duration (seconds)	Gamma	Signature	NAD 83 (ft) X	NAD 83 (ft) Y	Note	Correlation (Mag/acoustic)
M201	3	10:20:49.9	10:22:18.0	01:28.1	63.6	MC	3058963.8	612417.9		M185
M202	3	10:24:22.0	10:24:35.8	00:13.8	98.2	D	3058298.3	613010.5		
M203	3	10:25:48.1	10:26:10.1	00:22.0	264.6	D	3058283.4	613450.0		M177, M183
M204	3	10:26:38.1	10:27:08.3	00:30.2	114.6	MC	3058365.8	613746.9		
M205	3	10:28:56.3	10:29:06.1	00:09.8	42.8	D	3058976.8	614086.9		
Block 6										
M206	1	10:46:37.7	10:47:19.9	00:42.2	82.4	MC	3062972.9	615161.2		M230
M207	1	10:48:13.7	10:48:21.9	00:08.2	52.2	-	3063425.2	615111.2		
M208	1	10:49:27.5	10:50:01.4	00:33.9	80	MC	3063869.6	615336.4		
M209	1	10:50:45.9	10:51:37.5	00:51.6	223.4	MC	3064236.6	615864.1		
M210	1	10:52:07.6	10:52:55.8	00:48.2	67.2	MC	3064281.3	616265.5		M226, A32
M211	1	10:53:20.0	10:53:23.8	00:03.8	45475.4	-	3064329.0	616526.1	bulkhead	
M212	1	10:54:29.6	10:54:53.8	00:24.2	149.8	MC	3064592.0	616930.5		
M213	1	10:55:08.0	10:55:21.6	00:13.6	170	D	3064713.4	617063.9		
M214	1	10:55:55.6	10:56:35.6	00:40.0	3794.6	-	3065034.6	617205.2	Pinhook Bridge	M224, A33
M215	1	11:01:17.7	11:01:27.6	00:09.9	187.8	D	3066862.0	617250.9		
M216	1	11:03:08.0	11:03:20.0	00:12.0	90	MC	3067466.1	617431.0		
M217	1	11:04:11.6	11:04:38.0	00:26.4	543.8	MC	3067881.5	617632.3		
M218	1	11:04:51.7	11:05:09.8	00:18.1	143	D	3068069.8	617743.7		M220
M219	1	11:06:23.7	11:06:33.5	00:09.8	125.6	+	3068337.5	618134.5		M233, M274
M220	2	11:10:13.9	11:10:29.8	00:15.9	167.6	MC	3068090.5	617722.6	boat dock	M218
M221	2	11:10:44.0	11:11:09.8	00:25.8	156	MC	3067828.0	617593.3		
M222	2	11:11:36.0	11:11:53.6	00:17.6	40.8	D	3067552.3	617451.0		
M223	2	11:14:26.0	11:14:32.0	00:06.0	110	+	3066481.8	617163.6		
M224	2	11:17:31.8	11:18:39.8	01:08.0	3150.4	-	3065068.2	617178.0	bridge	M214, A33
M225	2	11:19:45.7	11:19:60.0	00:14.3	96.2	-	3064513.6	616746.9		
M226	2	11:21:01.9	11:21:10.1	00:08.2	1767.8	D	3064328.9	616306.6	Partially submerged modern wreck	M210, A32
M227	2	11:22:21.9	11:22:31.7	00:09.8	165.8	D	3064257.5	615773.3		
M228	2	11:23:01.9	11:24:03.8	01:01.9	163.2	MC	3064021.0	615431.6		
M229	2	11:24:49.8	11:25:17.9	00:28.1	37.8	MC	3063526.7	615100.2		
M230	2	11:26:21.8	11:26:39.9	00:18.1	256.4	D	3062943.0	615169.6		M206
M231	2	11:27:33.7	11:27:47.8	00:24.1	105.6	MC	3062564.1	615439.1		
M232	2	11:27:52.1	11:28:15.7	00:23.6	273	MC	3062386.4	615585.7		

Anomaly No.	Line No.	Start Time	End Time	Duration (seconds)	Gamma	Signature	NAD 83 (ft) X	NAD 83 (ft) Y	Note	Correlation (Mag/acoustic)
Block 7										
M233	1	08:43:17.9	08:43:32.1	00:14.2	45.8	MC	3068332.3	618166.4		M219, M274
M234	1	08:47:31.6	08:48:19.7	00:48.1	150.8	MC	3067814.6	619803.7	pipes and bulkhead	
M235	1	08:49:13.9	08:49:39.7	00:25.8	75.6	D	3068027.2	620289.8		M268
M236	1	08:51:08.0	08:52:00.0	00:52.0	80	MC	3068460.6	621039.2	debris	
M237	1	08:52:18.1	08:52:35.7	00:17.6	869.8	MC	3068558.7	621287.0		
M238	1	08:53:03.6	08:53:36.0	00:32.4	1863.6	MC	3068795.6	621564.4	bridge	
M239	1	08:54:01.7	08:54:29.6	00:27.9	2438.6	-	3069015.5	621776.7	pipelines on surface	M267, A36
M240	1	08:56:49.7	08:57:23.8	00:34.1	3101.8	-	3069728.4	622255.3	bridge	M264, A38
M241	1	08:57:44.1	08:58:19.8	00:35.7	80	MC	3069528.3	622444.4	debris	
M242	1	08:58:41.8	08:58:53.9	00:12.1	915	-	3069405.3	622709.0	pipes and bulkhead	
M243	1	08:59:52.0	09:00:10.0	00:18.0	95.8	MC	3069523.4	623114.8	collapsed bulkhead	
M244	1	09:00:28.1	09:00:39.6	00:11.5	330.2	D	3069660.4	623302.4	pipes near bank	M245, M262
M245	1	09:01:02.1	09:01:47.6	00:45.5	972.4	MC	3069901.4	623584.5	Trappy's Cannery bulkhead and debris	M244, M262
M246	1	09:02:35.8	09:02:59.9	00:24.1	1750	MC	3070205.6	623936.8	bridge	M261, A39
M247	1	09:04:57.9	09:05:12.1	00:14.2	105.2	MC	3070940.7	624228.9	fence	
M248	1	09:05:37.8	09:06:10.1	00:32.3	120.8	-	3071187.9	624250.4	debris	M258
M249	1	09:07:08.2	09:07:24.0	00:15.8	210.2	D	3071659.5	624508.6	park debris	
M250	1	09:08:28.1	09:08:53.9	00:25.8	334.4	MC	3072149.4	624844.7		
M251	1	09:09:57.8	09:10:33.9	00:36.1	1681	MC	09:10:33.9	625071.2	bridge and bulkhead	M255, A40
M252	1	09:11:28.1	09:12:09.7	00:41.6	87	MC	3073065.1	624878.8		
M253	1	09:12:21.8	09:12:48.1	00:26.3	90.4	MC	3073360.8	624711.4	pipes	M254
M254	2	09:17:51.7	09:17:58.1	00:06.4	60.2	+	3073346.0	624686.1		M253
M255	2	09:19:41.8	09:20:30.1	00:48.3	7015.8	-	3072603.5	625038.5	bridge and pipes	M251, A40
M256	2	09:21:32.0	09:21:41.9	00:09.9	880.6	D	3072131.6	624785.4	Waterman Pipe with cover	
M257	2	09:22:25.7	09:23:29.7	01:04.0	132.6	MC	3071728.9	624505.2		
M258	2	09:24:20.1	09:24:30.0	00:09.9	848.2	+	3071199.0	624244.3	bulkhead and dock	M248
M259	2	09:25:40.0	09:25:52.0	00:12.0	171.4	+	3070712.6	624136.9	dock	
M260	2	09:26:11.7	09:26:19.9	00:08.2	75	+	3070542.1	624068.7		
M261	2	09:27:02.1	09:27:31.7	00:29.6	1794.6	MC	3070199.7	623904.2	90 East Bridge	M246, A39
M262	2	09:29:12.1	09:29:24.2	00:12.1	1953.4	D	3069673.4	623283.0	pipes and bulkhead	M244, M245
M263	2	09:30:43.7	09:31:07.8	00:24.1	565.6	MC	3069481.7	622712.0		
M264	2	09:32:21.8	09:33:00.1	00:38.3	3102.2	-	3069812.8	622211.1	bridge	M240, A38
M265	2	09:33:40.1	09:33:46.2	00:06.1	52	+	3069744.3	621991.7	Mile 43 marker	
M266	2	09:34:17.9	09:34:38.3	00:20.4	76.2	MC	3069392.3	621881.9	debris	

Anomaly No.	Line No.	Start Time	End Time	Duration (seconds)	Gamma	Signature	NAD 83 (ft) X	NAD 83 (ft) Y	Note	Correlation (Mag/acoustic)
M267	2	09:35:06.3	09:35:41.9	00:35.6	2304.2	MC	3069013.3	621722.5	train bridge	M239, A36
M268	2	09:35:57.7	09:36:24.0	00:26.3	2574	MC	3068764.6	621530.5	small modern wrecked boat	M235
M269	2	09:36:58.1	09:37:51.8	00:53.7	235.4	MC	3068584.4	621215.4	bridge	
M270	2	09:38:21.8	09:38:27.8	00:06.0	65.4	+	3068396.0	620792.4		
M271	2	09:39:44.0	09:40:10.3	00:26.3	55.8	MC	3068057.2	620236.5	debris	
M272	2	09:40:36.0	09:41:07.8	00:31.8	88.6	MC	3067930.5	620018.2	debris	
M273	2	09:43:51.9	09:44:00.1	00:08.2	172	+	3068238.5	618900.2		
M274	2	09:45:42.1	09:45:52.0	00:09.9	145	D	3068352.6	618167.1		M219, M233
Block 8										
M275	1	10:35:09.9	10:35:53.8	00:43.9	114.2	MC	3074169.0	624432.8	Waterman Pipe with cover	
M276	1	10:37:24.2	10:38:35.9	01:11.7	208.6	MC	3075010.5	624494.0	fence	
M277	1	10:38:56.1	10:39:15.8	00:19.7	138.4	MC	3075335.6	624487.3	debris	
M278	1	10:42:44.0	10:43:14.1	00:30.1	126.2	-	3076706.8	624277.5	debris	
M279	1	10:45:32.3	10:45:54.2	00:21.9	819	-	3077540.0	623907.3	FAA Cable Crossing	
M280	1	10:47:12.0	10:47:21.9	00:09.9	60.4	D	3077649.9	623412.5		
M281	1	10:47:42.2	10:47:54.2	00:12.0	52.8	-	3077605.0	623246.8		
M282	1	10:49:08.2	10:49:14.3	00:06.1	60.4	MC	3077545.2	622741.7		
M283	1	10:57:16.0	10:57:37.9	00:21.9	44.2	MC	3078086.4	622609.6		
M284	1	10:59:40.2	10:59:58.3	00:18.1	33.2	+	3078877.1	622580.4		
M285	1	11:01:30.1	11:01:42.2	00:12.1	54.6	MC	3079485.6	622797.8		
M286	1	11:08:32.0	11:08:59.9	00:27.9	25.8	MC	3080130.7	623199.5		
M287	1	11:09:42.1	11:09:54.1	00:12.0	47.2	D	3080310.2	623492.8		
M288	1	11:11:54.0	11:12:14.3	00:20.3	43.4	+	3080890.4	623924.7		
M289	1	11:12:40.1	11:13:26.2	00:46.1	944	-	3081126.3	623849.3	United Gas Pipeline	
Block 9										
M290	1	11:32:17.0	11:32:51.0	00:34.0	277.6	MC	3084249.1	625569.6	Bridge 14	A42
M291	1	11:34:53.1	11:34:59.1	00:06.0	120.8	+	3084088.2	624774.8	pipes	
M292	1	11:36:06.9	11:37:13.3	01:06.4	77.4	MC	3083917.7	624126.6		
M293	1	11:40:21.0	11:40:48.9	00:27.9	78.8	MC	3083154.1	622996.2	debris	
M294	1	11:42:07.2	11:42:23.1	00:15.9	35.4	MC	3082606.6	623177.3		
M295	1	11:42:39.0	11:43:07.0	00:28.0	69.6	MC	3082353.1	623167.7	working waterpump on surface	
M296	1	11:43:13.0	11:43:21.2	00:08.2	40.2	D	3082226.1	623133.0		

Table 10. Table of Acoustic Anomalies Identified During Remote Sensing Survey

Anom No.	Block No.	Line No.	Start Time	End Time	Duration (seconds)	Corrected NAD83 (ft)		Description	Correlations (mag/acoustic)
						X	Y		
A1	1	3	14:46:02	14:48:46	02:44.0	3043355.35	592617.42	large piece of debris	
A2	1	3	14:48:46	14:49:41	00:55.0	3042553.61	591631.23	long area of debris	M20, M31
A3	1	3	14:49:51	14:50:20	00:29.0	3042294.19	591321.49	broken bulkhead	
A4	1	3	14:52:45	14:52:55	00:10.0	3041678.22	590337.66	debris	
A5	1	3	14:54:01	14:54:25	00:24.0	3041393.47	589928.25	pipeline crossing	
A6	1	3	14:55:59	14:56:36	00:37.0	3041386.71	589157.35	debris	M17, M28, A8
A7	1	3	15:00:50	15:00:56	00:06.0	3041836.25	587430.18	pipeline crossing	M16, M27, A15
A8	1	3	15:03:09	15:04:11	01:02.0	3041304.30	589131.89	broken bulkhead	M17, M28, A6
A9	1	3	15:04:54	15:05:21	00:27.0	3042524.54	585980.02	line of debris	
A10	1	3	15:09:35	15:09:47	00:12.0	3044220.70	585326.21	line of debris	
A11	1	4	15:26:22	15:26:43	00:21.0	3044867.19	583998.95	Milton Bridge	M1, M8, M23
A12	1	4	15:28:37	15:29:19	00:42.0	3044609.06	584788.58	line of debris	
A13	1	4	15:37:30	15:37:40	00:10.0	3042066.63	586731.63	pipe coming out of bank	
A14	1	4	15:38:38	15:38:44	00:06.0	3041939.07	587050.72	debris 10 ft long	M6, M14
A15	1	4	15:39:44	15:39:55	00:11.0	3041856.17	587477.69	Louisiana Gas Pipeline	M16, M27, A7
A16	1	4	15:46:20	15:46:50	00:30.0	3041637.63	590268.11	pipeline crossing	
A17	1	4	15:52:30	15:52:56	00:26.0	3042592.42	591854.30	debris	
A18	2	1	10:16:34	10:17:10	00:36.0	3042997.05	592428.22	scattered debris	M21, M32
A19	2	1	10:21:37	10:21:43	00:06.0	3044441.70	593208.86	scattered debris	
A20	2	1	10:25:59	10:26:05	00:06.0	3045301.77	594539.60	isolated large pipe	
A21	2	1	10:32:55	10:34:28	01:33.0	3045731.86	597373.65	Acadiana shell & sand debris	M,38, M50, M64
A22	2	1	10:35:25	10:35:40	00:15.0	3046086.32	597833.04	Eloi Broussard Bridge	M39, M51, M65
A23	2	1	10:40:34	10:40:42	00:08.0	3046497.54	599509.35	Texas Gas Pipeline	M40, M48, M23
A24	2	3	11:15:08	11:15:14	00:06.0	3044063.29	592991.11	Columbia Gas Pipeline	M57
A25	2	4	11:47:27	11:47:38	00:11.0	3046752.00	599762.27	long piece of debris	M41
A26	3	1	12:09:00	12:09:28	00:28.0	3050653.44	600508.46	large debris field	
A27	3	2	12:42:30	12:42:41	00:11.0	3049915.22	604008.86	large debris field	M86, M98, M113
A28	3	2	12:53:40	12:53:46	00:06.0	3050691.1745	600566.37	large isolated debris sticking up	
A29	3	3	13:21:40	13:21:48	00:08.0	3050265.98	602557.87	large debris field	
A30	4	1	13:52:50	13:52:58	00:08.0	3053763.45	608148.92	pipes in water	
A31	5	3	10:04:27	10:04:48	00:21.0	3055676.74	611779.82	large debris field	
A32	6	1	10:52:16	10:52:30	00:14.0	3064313.02	616239.93	Modern shrimpboat wreck	M210, M226
A33	6	1	10:56:15	10:56:25	00:10.0	3065113.09	617208.96	Pinhook Bridge	M214, M224
A34	7	1	8:49:52	8:49:59	00:07.0	3068160.30	620503.61	Modern small boat wreck	
A35	7	1	8:50:15	8:50:24	00:09.0	3068315.16	620532.71	Modern small boat wreck	
A36	7	1	8:53:15	8:53:25	00:10.0	3068772.70	621532.25	No named bridge	M239, M268
A37	7	1	8:54:15	8:54:30	00:15.0	3069026.71	621755.02	railroad trestle	M239, M267
A38	7	1	8:56:53	8:57:08	00:15.0	3069787.73	622149.70	Rt 90 Bridge	M264, M240
A39	7	1	9:02:27	9:02:53	00:26.0	3070123.52	623870.11	Two bridges	M246, M261
A40	7	1	9:10:09	9:10:20	00:11.0	3072620.37	625055.81	Small iron bridge	M251, M255
A41	7	1	9:23:32	9:23:40	00:08.0	3071465.55	624360.30	large piece of debris	
A42	9	1	11:31:20	11:31:41	00:21.0	3084278.74	625717.98	353 Bridge	
A43	4	2	14:42:01	14:42:35	00:34.0	3052539.67	605400.62	Ambassador Caffery Bridge	M123, M153, M154

Table 11. Table of Targets Identified During Remote Sensing Survey

Anomaly No.	Block No.	Line	Start Time	End Time	Duration	Gamma	Signature	Corrected NAD83 (ft) X	Corrected NAD83 (ft) Y	Comments	Recommendation
Target #1											
M1	1	1	13:57:40.1	13:58:30.0	00:49.9	44543	D	3044819.5	584030.0	debris and Milton Bridge	No further study
M8	1	3	15:13:16.1	15:13:42.4	00:26.3	8020.6	D	3044834.7	584030.1	bridge and debris	
M23	1	4	15:26:01.1	15:27:06.8	01:05.7	7934.2	D	3044844.0	584038.8	bridge and debris	
A11	1	4	15:26:22	15:26:43	00:21.0			3044867.2	583999.0	Milton Bridge	
Target #2											
M13	1	3	15:08:24.1	15:09:46.4	01:22.3	105.8	MC	3043877.2	585382.8	metal bulkhead	No further study
M24	1	4	15:30:42.8	15:32:02.9	01:20.1	162.4	MC	3043875.0	585404.9	metal bulkhead	
Target #3											
M5	1	1	14:08:54.2	14:09:46.2	00:52.0	438.2	+	3042227.9	586391.1	boat launch	No further study
M14	1	3	15:03:14.1	15:04:04.5	00:50.4	72.2	+	3042261.3	586391.0	boat on surface	
Target #4											
M6	1	1	14:11:12.3	14:12:06.0	00:53.7	436.8	MC	3041905.3	587074.0	gas pipeline	No further study
M15	1	3	15:01:12.4	15:01:52.5	00:40.1	217	D	3041925.9	587167.4	Louisiana Gas System Pipeline and Conoco	
A14	1	4	15:38:38	15:38:44	00:06.0			3041939.1	587050.7	debris 10 ft long	
Target #5											
M16	1	3	15:00:26.4	15:01:02.6	00:36.2	348.6	+	3041815.9	587464.5	pipeline	No further study
M27	1	4	15:39:27.1	15:40:01.2	00:34.1	775.8	+	3041864.1	587471.5	Louisiana Gas System Pipeline and Shell	
A7	1	3	15:00:50	15:00:56	00:06.0			3041836.3	587430.2	pipeline crossing	
A15	1	3	15:39:44	15:39:55	00:11.0			3041856.2	587477.7	Louisiana Gas Pipeline	
Target #6											
M17	1	3	14:56:04.4	14:56:18.2	00:13.8	68.6	D	3041368.8	589113.1		No further study
M28	1	4	15:44:17.1	15:44:29.1	00:12.0	24.4	D	3041382.5	589128.8	very noisy bottom	
A6	1	3	14:55:59	14:56:36	00:37.0			3041386.7	589157.3	debris	
A8	1	3	15:03:09	15:04:11	01:02.0			3041304.3	589131.9	broken bulkhead	
Target #7											
M18	1	3	14:53:20.5	14:54:06.1	00:45.6	106.6	-	3041536.2	590048.5	pipes	No further study
M29	1	4	15:46:33.2	15:47:04.9	00:31.7	50.6	D	3041592.8	590079.8	pipes	
Target #8											
M20	1	3	14:49:08.5	14:49:48.5	00:40.0	333.2	-	3042555.7	591593.6		No further study
M31	1	4	15:51:13.2	15:51:54.9	00:41.7	365.6	-	3042560.8	591600.9	debris	
A2	1	3	14:48:46	14:49:41	00:55.0			3042553.6	591631.2	long area of debris	
Target #9											
M21	1	3	14:47:00.0	14:47:10.5	00:10.5	38.4	-	3042987.8	592406.1		No further study
M32	1	4	15:53:55.3	15:54:13.4	00:18.1	39.2	D	3042996.0	592401.5		

Anomaly No.	Block No.	Line	Start Time	End Time	Duration	Gamma	Signature	Corrected NAD83 (ft) X	Y	Comments	Recommendation
A18	2	1	10:16:34	10:17:10	00:36.0			3042997.0	592428.2	scattered debris	
Target #10											
M57	2	4	11:24:40.2	11:24:56.1	00:15.9	1103.2	+	3044033.9	592959.7	pipeline	No further study
A24	2	3	11:15:08	11:15:14	00:06.0			3044063.3	592991.1	Columbia Gas Pipeline	
Target #11											
M33	2	1	10:20:44.2	10:20:57.9	00:13.7	43292.4	-	3044172.0	593087.9	Columbia Gulf Transmission Pipeline	No further study
M46	2	3	11:14:42.3	11:15:20.1	00:37.8	4560.6	D	3044176.7	593036.6		
M53	2	3	10:54:40.1	10:55:32.2	00:52.1	1087.4	-	3046591.0	599450.9	bulkhead and barge on surface	
Target #12											
M36	2	1	10:30:53.9	10:31:11.9	00:18.0	688.4	D	3045516.6	596388.5	bulkhead and pipeline	No further study
M49	2	3	11:04:06.4	11:04:40.4	00:34.0	173.8	D	3045640.4	596348.7	debris	
M63	2	4	11:36:18.5	11:36:54.6	00:36.1	284.8	D	3045627.5	596351.6		
Target #13											
M38	2	1	10:33:10.3	10:34:44.0	01:33.7	16862.2	MC	3045733.4	597414.8	Acadiana Shell and Sand barge	No further study
M50	2	3	11:00:38.4	11:02:06.0	01:27.6	93.6	-	3045827.0	597414.4	bulkhead	
M64	2	4	11:38:00.3	11:40:40.6	02:40.3	635.4	-	3045887.4	597402.2	barge on surface	
A21	2	1	10:32:55	10:34:28	01:33.0			3045731.9	597373.7	Acadiana Shell and Sand debris	
Target #14											
M39	2	1	10:35:22.3	10:36:03.9	00:41.6	3964.2	D	3046068.4	597879.1	Eloi Broussard Bridge	No further study
M51	2	3	10:59:22.4	11:00:08.3	00:45.9	5922.6	D	3046106.5	597720.3	Eloi Broussard Bridge	
M65	2	4	11:40:58.2	11:41:38.2	00:40.0	6231.6	D	3046154.5	597678.7	Eloi Broussard Bridge	
A22	2	1	10:35:25	10:35:40	00:15.0			3046086.3	597833.0	Eloi Broussard Bridge	
Target #15											
M66	2	4	11:42:14.4	11:42:38.5	00:24.1	166.4	-	3046240.7	598144.4	submerged cable	No further study
Target #16											
M52	2	3	10:56:40.2	10:57:16.4	00:36.2	66.4	MC	3046320.0	598822.1	Texas Gas Corp. Pipeline	No further study
M68	2	4	11:44:04.6	11:44:46.2	00:41.6	86.8	MC	3046326.4	598800.8	submerged cable	
Target #17											
M40	2	1	10:40:38.4	10:41:16.2	00:37.8	1852.6	D	3046528.8	599585.2	debris	No further study
M48	2	3	11:05:28.1	11:06:14.2	00:46.1	102.6	MC	3045722.0	595801.2		
M69	2	4	11:46:14.3	11:47:10.3	00:56.0	1149.4	MC	3046559.8	599529.4	Texas Gas Corp. Pipeline	
A23	2	1	10:40:34	10:40:42	00:08.0			3046497.5	599509.4	Texas Gas Pipeline	
Target #18											
M41	2	1	10:41:40.4	10:42:07.9	00:27.5	100.4	-	3046716.0	599812.1	Texas Gas Corp. Pipeline	No further study
A25	2	4	11:47:27	11:47:38	00:11.0			3046752.0	599762.3	long piece of debris	

Anomaly No.	Block No.	Line	Start Time	End Time	Duration	Gamma	Signature	Corrected NAD83 (ft) X	Y	Comments	Recommendation
Target # 19											
M101	3	2	13:00:57.1	13:01:03.1	00:06.0	71.2	+	3048319.4	599136.8		No further study
M102	3	3	13:06:03.1	13:06:09.1	00:06.0	42	+	3048315.3	599129.2		
Target #20											
M83	3	1	12:15:59.1	12:16:24.9	00:25.8	65.8	MC	3050233.3	602422.7	debris	No further study
M99	3	2	12:46:57.3	12:47:11.0	00:13.7	41.8	D	3050243.7	602434.4		
Target #21											
M86	3	1	12:19:51.0	12:22:01.0	02:10.0	231.8	D	3049980.6	604054.6	debris and bulkhead	No further study
M98	3	2	12:42:19.4	12:43:11.4	00:52.0	755.8	D	3050020.9	604031.9	dock and bulkhead	
M113	3	3	13:25:35.5	13:26:37.3	01:01.8	1367.4	D	3050035.7	603982.2	barge on surface	
A27	3	2	12:42:30	12:42:41	00:11.0			3049915.2	604008.9	large debris field	
Target #22											
M97	3	2	12:41:19.2	12:41:29.1	00:09.9	31.8	D	3050100.1	604484.0		No further study
M115	3	3	13:27:33.7	13:27:45.2	00:11.5	30.4	D	3050101.5	604469.6		
Target #23											
M87	3	1	12:23:39.3	12:24:23.2	00:43.9	147.6	D	3050245.6	605091.7	bulkhead	No further study
M95	3	2	12:39:29.1	12:39:49.4	00:20.3	22.2	-	3050286.1	605068.8		
M117		3	13:29:17.3	13:29:37.6	00:20.3	40	-	3050329.1	605083.7	bulkhead	
Target #24											
M88	3	1	12:25:15.3	12:26:11.2	00:55.9	55	-	3050584.9	605314.0		No further study
M118	3	3	13:30:21.5	13:30:59.3	00:37.8	124.2	D	3050570.4	605275.3	boat on surface	
Target #25											
M92	3	2	12:36:03.2	12:36:21.2	00:18.0	308.2	MC	3051386.6	605284.7		No further study
M120	3	3	13:32:45.6	13:33:21.3	00:35.7	426	MC	3051382.1	605279.6		
Target #26											
M90	3	1	12:29:29.4	12:30:07.3	00:37.9	99.8	MC	3051982.6	605124.3	Sanitary Canal	No further study
M91	3	2	12:34:23.4	12:34:35.4	00:12.0	219.8	+	3051982.6	605093.6	Sanitary Canal	
M121		3	13:34:35.7	13:34:55.5	00:19.8	89.8	D	3052017.2	605129.1		
Target #27											
M123	4	1	13:41:42.7	13:42:32.6	00:49.9	5870.8	D	3052558.7	605367.9	Sanitary Canal	No further study
M153	4	2	14:42:11.0	14:42:38.9	00:27.9	6,905.40	D	3052565.5	605381.5	Ambassador Caffery Bridge	
M154	4	3	14:46:25.1	14:47:00.7	00:35.6	7300.4	D	3052589.4	605382.4	Ambassador Caffery Bridge	
A43	4	2	14:42:01	14:42:35	00:34.0			3052539.7	605400.6	Ambassador Caffery Bridge	
Target #28											
M124	4	1	13:43:18.7	13:43:26.4	00:07.7	143	-	3052799.0	605703.9		No further study
M152	4	2	14:41:21.1	14:41:27.2	00:06.1	65	D	3052824.9	605684.9		
M155	4	3	14:47:51.2	14:48:07.1	00:15.9	179.6	D	3052859.1	605690.4	bulkhead	
Target #29											
M125	4	1	13:47:18.8	13:47:38.5	00:19.7	1469.6	D	3052576.7	607049.9	bulkhead	

Anomaly No.	Block No.	Line	Start Time	End Time	Duration	Gamma	Signature	Corrected NAD83 (ft) X	Y	Comments	Recommendation
M151	4	2	14:37:39.0	14:37:53.2	00:14.2	896.6	MC	3052603.0	607076.8		No further study
M156	4	3	14:52:07.0	14:52:25.1	00:18.1	595.2	MC	3052619.6	607069.5	bulkhead	
Target #30											
M126	4	1	13:49:20.4	13:49:36.8	00:16.4	423	D	3052714.0	607693.9		No further study
M150	4	2	14:35:57.0	14:36:15.1	00:18.1	200	MC	3052753.2	607704.8		
Target #31											
M127	4	1	13:49:58.8	13:50:42.6	00:43.8	608.2	MC	3052925.4	607926.5	bulkhead	No further study
M149	4	2	14:35:07.1	14:35:35.1	00:28.0	1058.6	D	3052969.2	607920.6	Koch Gateway Pipeline	
M157	4	3	14:54:43.1	14:55:08.8	00:25.7	785	MC	3052975.2	607914.8	bulkhead	
Target #32											
M131	4	1	13:56:32.7	13:57:00.6	00:27.9	79	MC	3055036.1	607967.0		No further study
M147	4	2	14:29:18.9	14:29:44.6	00:25.7	151	MC	3055037.2	607938.3	debris	
M158	4	3	15:00:55.0	15:01:19.0	00:24.0	208.4	MC	3055031.1	607923.2	pipes and bulkhead	
Target #33											
M146	4	2	14:28:36.7	14:28:44.9	00:08.2	81.6	D	3055179.8	608263.7		No further study
M159	4	3	15:01:59.0	15:02:07.2	00:08.2	35	+	3055170.5	608247.9	debris	
Target #34											
M145	4	2	14:28:06.6	14:28:18.7	00:12.1	90.2	D	3055188.1	608419.8		No further study
M160	4	3	15:02:25.2	15:02:32.9	00:07.7	80.2	D	3055186.2	608417.8		
Target #35											
M143	4	2	14:22:32.7	14:22:47.0	00:14.3	30	MC	3054271.6	610340.8	caution buoy	No further study
M162	4	3	15:08:35.0	15:08:41.1	00:06.1	43	-	3054286.0	610321.4		
Target #36											
M142	4	2	14:21:56.5	14:22:20.7	00:24.2	118.2	MC	3054277.6	610552.8		No further study
M163	4	3	15:09:06.8	15:09:24.9	00:18.1	157.2	MC	3054288.6	610570.9		
Target #37											
M140	4	2	14:20:59.1	14:21:15.0	00:15.9	205.2	MC	3054315.1	610995.6		No further study
M164	4	3	15:10:03.3	15:10:38.9	00:35.6	607.4	MC	3054308.8	610984.4	canal opening	
Target #38											
M189	5	2	09:59:45.7	09:59:57.7	00:12.0	158	MC	3056515.8	611382.4		No further study
M194	5	3	10:07:39.8	10:07:50.1	00:10.3	318	D	3056518.8	611357.8		
Target #39											
M169	5	1	09:16:11.9	09:16:25.6	00:13.7	65.4	MC	3057138.7	611139.4		No further study
M188	5	2	09:57:60.0	09:58:21.9	00:21.9	62.8	MC	3057064.7	611084.5		
M195	5	3	10:09:32.2	10:09:51.8	00:19.6	66.4	MC	3057116.3	611087.9		
Target #40											
M170	5	1	09:18:48.0	09:19:07.8	00:19.8	60	+	3057904.1	610730.3		No further study
M187	5	2	09:55:36.0	09:55:48.0	00:12.0	40.2	MC	3057877.6	610717.8		
Target #41											

Anomaly No.	Block No.	Line	Start Time	End Time	Duration	Gamma	Signature	Corrected NAD83 (ft) X	Corrected NAD83 (ft) Y	Comments	Recommendation
M185	5	2	09:47:19.8	09:47:35.7	00:15.9	294.4	D	3058941.4	612406.3		No further study
M201	5	3	10:20:49.9	10:22:18.0	01:28.1	63.6	MC	3058963.8	612417.9		
Target #42											
M177	5	1	09:31:02.0	09:31:09.7	00:07.7	311.2	-	3058291.8	613514.3		No further study
M183	5	2	09:43:19.8	09:43:37.9	00:18.1	170.4	+	3058310.2	613464.3		
M203	5	3	10:25:48.1	10:26:10.1	00:22.0	264.6	D	3058283.4	613450.0		
Target #43											
M230	6	2	11:26:21.8	11:26:39.9	00:18.1	256.4	D	3062943.0	615169.6		No further study
M206	6	1	10:46:37.7	10:47:19.9	00:42.2	82.4	MC	3062972.9	615161.2		
Target #44											
M210	6	1	10:52:07.6	10:52:55.8	00:48.2	67.2	MC	3064281.3	616265.5		No further study
M226	6	2	11:21:01.9	11:21:10.1	00:08.2	1767.8	D	3064328.9	616306.6	Partially submerged modern wreck	
A32	6	1	10:52:16	10:52:30	00:14.0			3064313.0	616239.9	Modern shrimp boat wreck	
Target #45											
M214	6	1	10:55:55.6	10:56:35.6	00:40.0	3794.6	-	3065034.6	617205.2	Pinhook Bridge	No further study
M224	6	2	11:17:31.8	11:18:39.8	01:08.0	3150.4	-	3065068.2	617178.0	bridge	
A33	6	1	10:56:15	10:56:25	00:10.0			3065113.1	617209.0	Pinhook Bridge	
Target #46											
M218	6	1	11:04:51.7	11:05:09.8	00:18.1	143	D	3068069.8	617743.7		No further study
M220	6	2	11:10:13.9	11:10:29.8	00:15.9	167.6	MC	3068090.5	617722.6	boat dock	
Target #47											
M219	6	1	11:06:23.7	11:06:33.5	00:09.8	125.6	+	3068337.5	618134.5		No further study
M233	7	1	08:43:17.9	08:43:32.1	00:14.2	45.8	MC	3068332.3	618166.4		
M274	7	2	09:45:42.1	09:45:52.0	00:09.9	145	D	3068352.6	618167.1		
Target #48											
M235	7	1	08:49:13.9	08:49:39.7	00:25.8	75.6	D	3068027.2	620289.8		No further study
M268	7	2	09:35:57.7	09:36:24.0	00:26.3	2574	MC	3068764.6	621530.5	small modern wrecked boat	
Target #49											
M239	7	1	08:54:01.7	08:54:29.6	00:27.9	2438.6	-	3069015.5	621776.7	pipelines on surface	No further study
M268	7	2	09:35:57.7	09:36:24.0	00:26.3	2574	MC	3068764.6	621530.5	small modern wrecked boat	
A36	7	1	8:53:15	8:53:25	00:10.0			3068772.7	621532.3	Gen Mouton Bridge	
Target #50											
M239	7	1	08:54:01.7	08:54:29.6	00:27.9	2438.6	-	3069015.5	621776.7	pipelines on surface	No further study
M267	7	2	09:35:06.3	09:35:41.9	00:35.6	2304.2	MC	3069013.3	621722.5	Railroad Trestle	
A37	7	1	8:54:15	8:54:30	00:15.0			3069026.7	621755.0	Railroad Trestle	
Target #51											
M264	7	2	09:32:21.8	09:33:00.1	00:38.3	3102.2	-	3069812.8	622211.1	bridge	No further study
M240	7	1	08:56:49.7	08:57:23.8	00:34.1	3101.8	-	3069728.4	622255.3	bridge	

Anomaly No.	Block No.	Line	Start Time	End Time	Duration	Gamma	Signature	Corrected NAD83 (ft) X	Corrected NAD83 (ft) Y	Comments	Recommendation
A38	7	1	8:56:53	8:57:08	00:15.0			3069787.7	622149.7	E. University Bridge	
Target #52											
M244	7	1	09:00:28.1	09:00:39.6	00:11.5	330.2	D	3069660.4	623302.4	pipes near bank	No further study
M245	7	1	09:01:02.1	09:01:47.6	00:45.5	972.4	MC	3069901.4	623584.5	Trappy's Cannery bulkhead and associate debris	
M262	7	2	09:29:12.1	09:29:24.2	00:12.1	1953.4	D	3069673.4	623283.0	pipes and bulkhead	
Target #53											
M246	7	1	09:02:35.8	09:02:59.9	00:24.1	1750	MC	3070205.6	623936.8	bridge	No further study
M261	7	2	09:27:02.1	09:27:31.7	00:29.6	1794.6	MC	3070199.7	623904.2	90 East Bridge	
A39	7	1	9:02:27	9:02:53	00:26.0			3070123.5	623870.1	Two bridges	
Target #54											
M248	7	1	09:05:37.8	09:06:10.1	00:32.3	120.8	-	3071187.9	624250.4	debris	No further study
M258	7	2	09:24:20.1	09:24:30.0	00:09.9	848.2	+	3071199.0	624244.3	bulkhead and dock	
Target #55											
M251	7	1	09:09:57.8	09:10:33.9	00:36.1	1681	MC	09:10:33.9	625071.2	bridge and bulkhead	No further study
M255	7	2	09:19:41.8	09:20:30.1	00:48.3	7015.8	-	3072603.5	625038.5	bridge and pipes	
A40	7	1	9:10:09	9:10:20	00:11.0			3072620.4	625055.8	Surry St. Bridge	
Target #56											
M253	7	1	09:12:21.8	09:12:48.1	00:26.3	90.4	MC	3073360.8	624711.4	pipes	No further study
M254	7	2	09:17:51.7	09:17:58.1	00:06.4	60.2	+	3073346.0	624686.1		
Target #57											
M279	8	1	10:45:32.3	10:45:54.2	00:21.9	819	-	3077540.0	623907.3	FAA Cable Crossing	No further study
Target #58											
M289	8	1	11:12:40.1	11:13:26.2	00:46.1	944	-	3081126.3	623849.3	United Gas Pipeline	No further study
Target #59											
M291	9	1	11:34:53.1	11:34:59.1	00:06.0	120.8	+	3084088.2	624774.8	pipes	No further study
Target #60											
M290	9	1	11:32:17.0	11:32:51.0	00:34.0	277.6	MC	3084249.1	625569.6	Rt. 353 Bridge	No further study
A42	9	1	11:31:20	11:31:41	00:21.0			3084278.7	625718.0	Rt. 353 Bridge	

Table 12. Inventory of Shipping Losses

Vessel Name	Rig	Date Lost	Location	Comments
Georgia	Sidewheel	3-29-1842	Between Vermilionville & Bayou Tortue	Reported to have burned, exact location not given
Gretna	Sidewheel	5-17-1851	Below Bayou Tortue	Explosion and fire, 3 reported dead
Assumption	Sternwheeler	6-20-1895	Below Rt. 353 Bridge (above Bayou Tortue)	Struck a bar and run aground to avoid sinking, reported abandoned.
Lillian	Unknown	2-19-1924	Pinhook Bridge	Reported to have burned and abandoned near Pinhook Bridge.

Milton Bridge in Milton to the Rt 353 Bridge near Lake Martin, just outside Lafayette. Most of these bridges are drawbridges; however, a railroad trestle, an old iron bridge, and several cement bridges also are present. All the bridge structures generated both high magnetic disturbances and strong acoustic images. Milton Bridge, at the southern terminus of the survey area in Block 1, was Target 1 (M1, M8, M23, and A11) (Figures 34[acoustic] and 35[photo]). The Eloi Broussard Bridge was Target 14 (M39, M51, M65 and A22) (Figure 36[photo] and 37[acoustic). This target is located in Block 2, and it has a water pipe associated with it. Target 27 (M123, M153, M154 and A43) is the Ambassador Caffery Bridge located in Block 4 (Figures 38 and 39). Target 45 (M214, M224, and A33) is the Pinhook Bridge located in Block 6, in the heart of the City of Lafayette (Figures 40[acoustic] and 41[photo]). The Mouton Avenue Bridge is Target 49 (M238, 268, and A36) (Figures 42 and 43); this target also includes a small modern wrecked boat (M268) located near the Mouton Bridge in Block 7. Target 50 is the Southern Pacific Railroad trestle located in Block 7 (Figure 44). The University Avenue Bridge, located in Block 7, is Target 51 (M264, M240, and A38) (Figure 45). Target 53 (M261, M246, and A39) is the Route 90 Bridge, located on the east side of Lafayette in Block 7 of the survey area (Figure 46). The Surrey Street Bridge is Target 55 (M251, M255, and A40), also in Block 7 (Figures 47 and 48). The last bridge in the survey area is the Lake Martin Route 353 Bridge, which is Target 60 (M290 and A42) (Figures 49 and 50). This bridge is at the other terminus of the survey area in Block 9, just northeast of Lafayette. No further work is warranted for any of the bridge targets.

Pipelines and Cables

Lafayette is known as "Hub City" for the oil and gas industry; thus, there are a number of petroleum and gas pipelines that extend across the Vermilion River. Target 4 (M6 and M15) consists of two adjacent pipelines that run under the bottom sediment of the Vermilion River in Block 1. These two gas pipelines are the 8-in Conoco Gas Pipeline (M6) and the 16-in Louisiana Gas System Pipeline (M15) (Figures 51, 52, 53). Target 5 consists of two pipelines, also in Block 1: the Shell Gas Pipeline (M27), and the 12-in Louisiana Gas System Pipeline (M16) (Figures 54). The twin Columbia Gulf Transmission Pipelines are Targets 10 and 11 (Figures 55 and 56); these two pipelines lie approximately 50 ft from one another in Block 2. Target 10 consists of one acoustic anomaly (A 24) and one magnetic anomaly

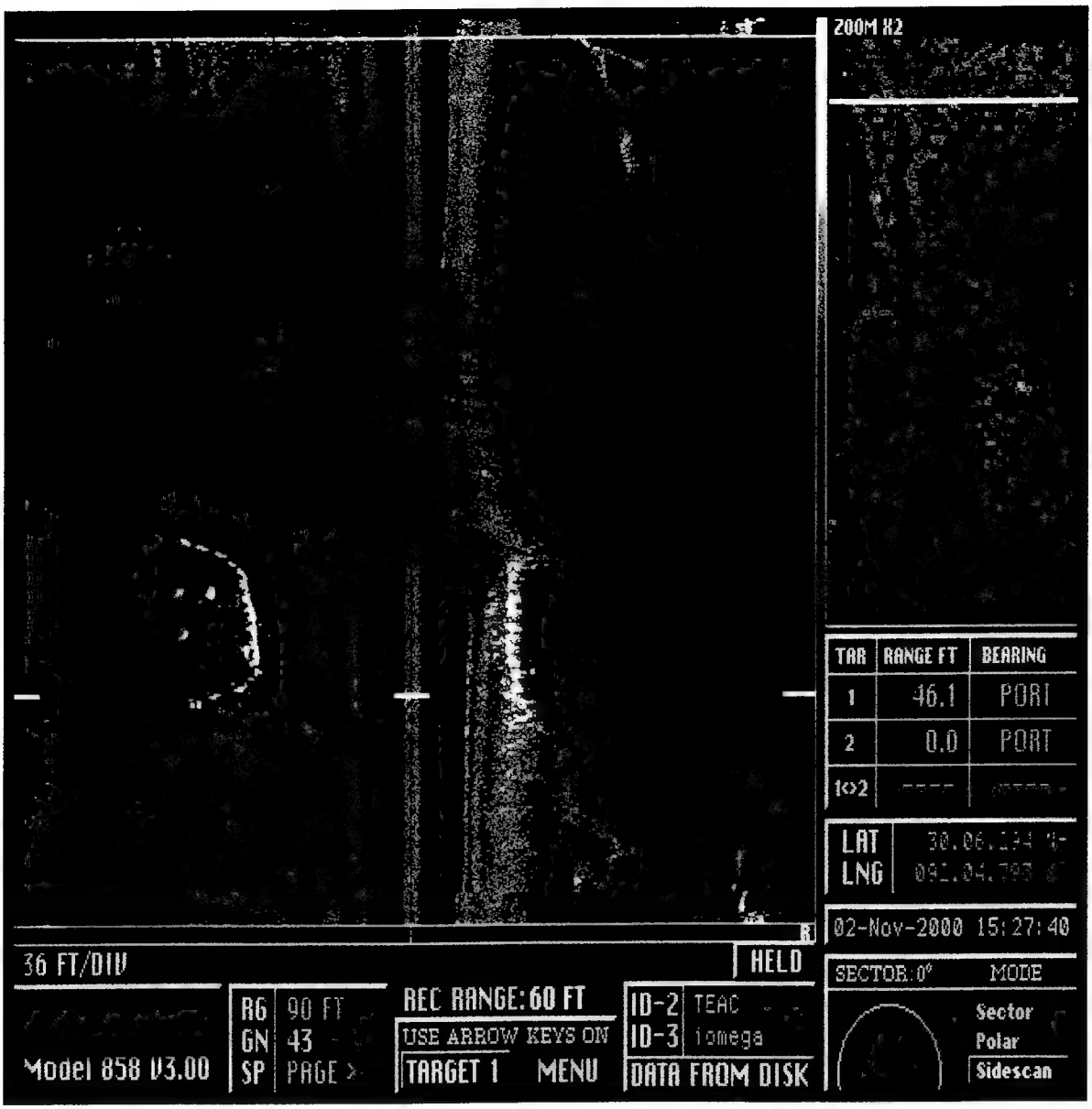

Figure 34. Acoustic image of Milton Bridge

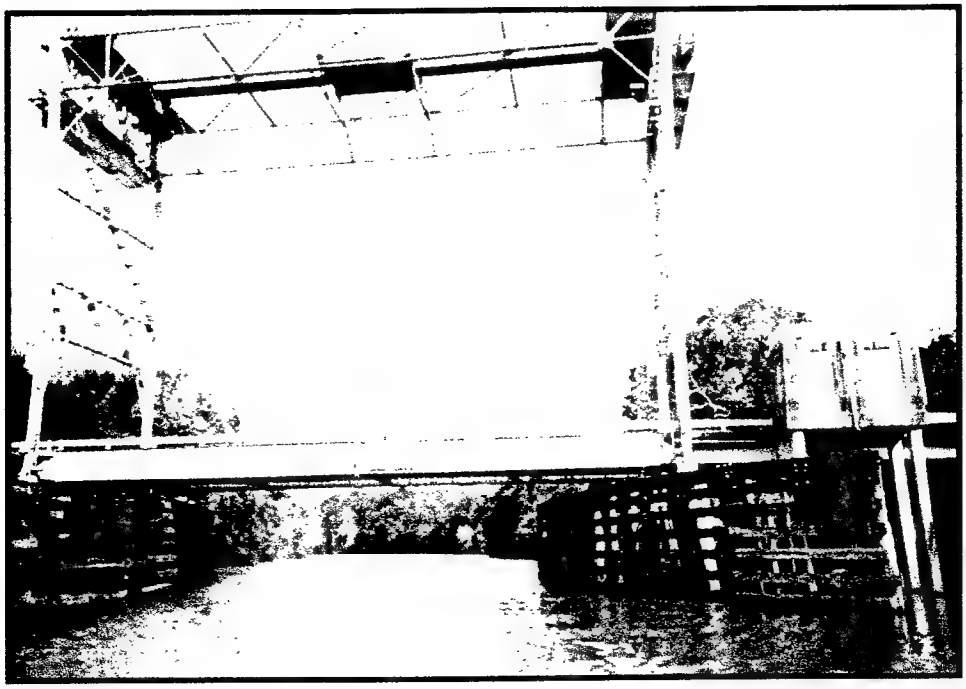

Figure 35. Photograph of Milton Bridge

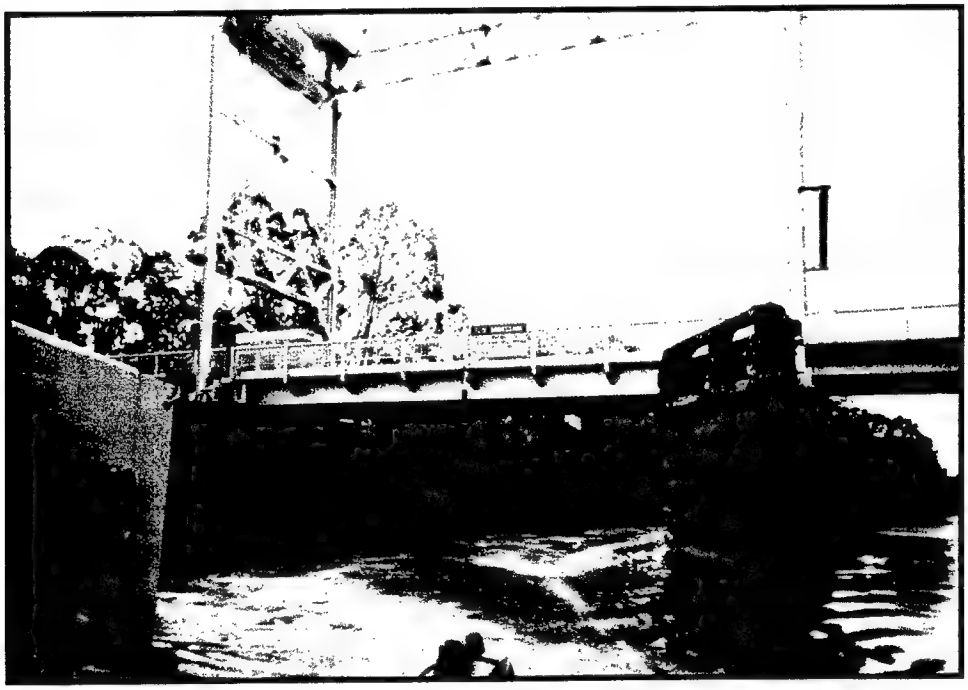

Figure 36. Photograph of Eloi Broussard Bridge

Figure 37. Acoustic image of Eloi Broussard Bridge

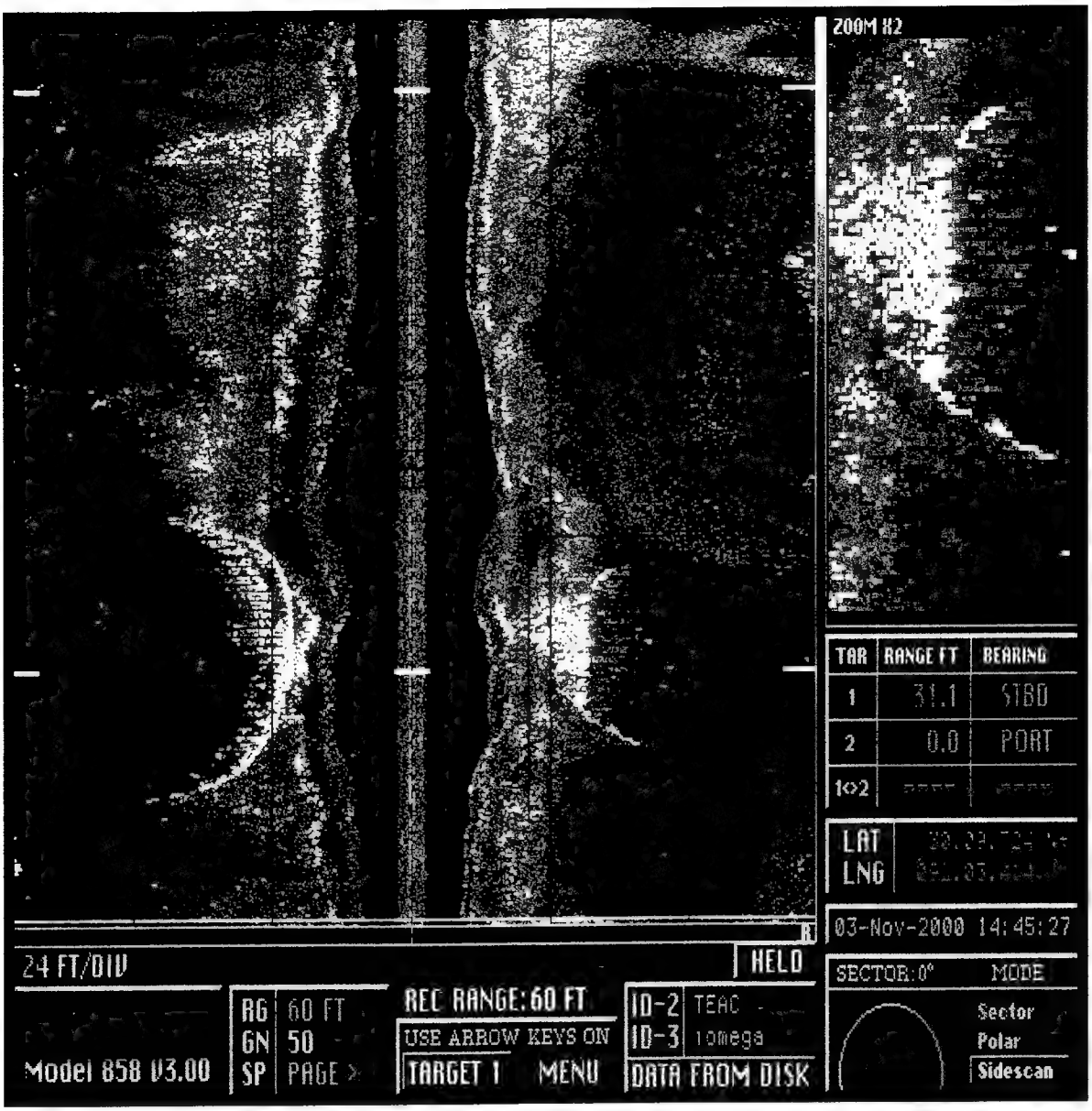

Figure 38. Acoustic image of Ambassador Caffery Bridge

Figure 39. Photograph of Ambassador Caffery Bridge

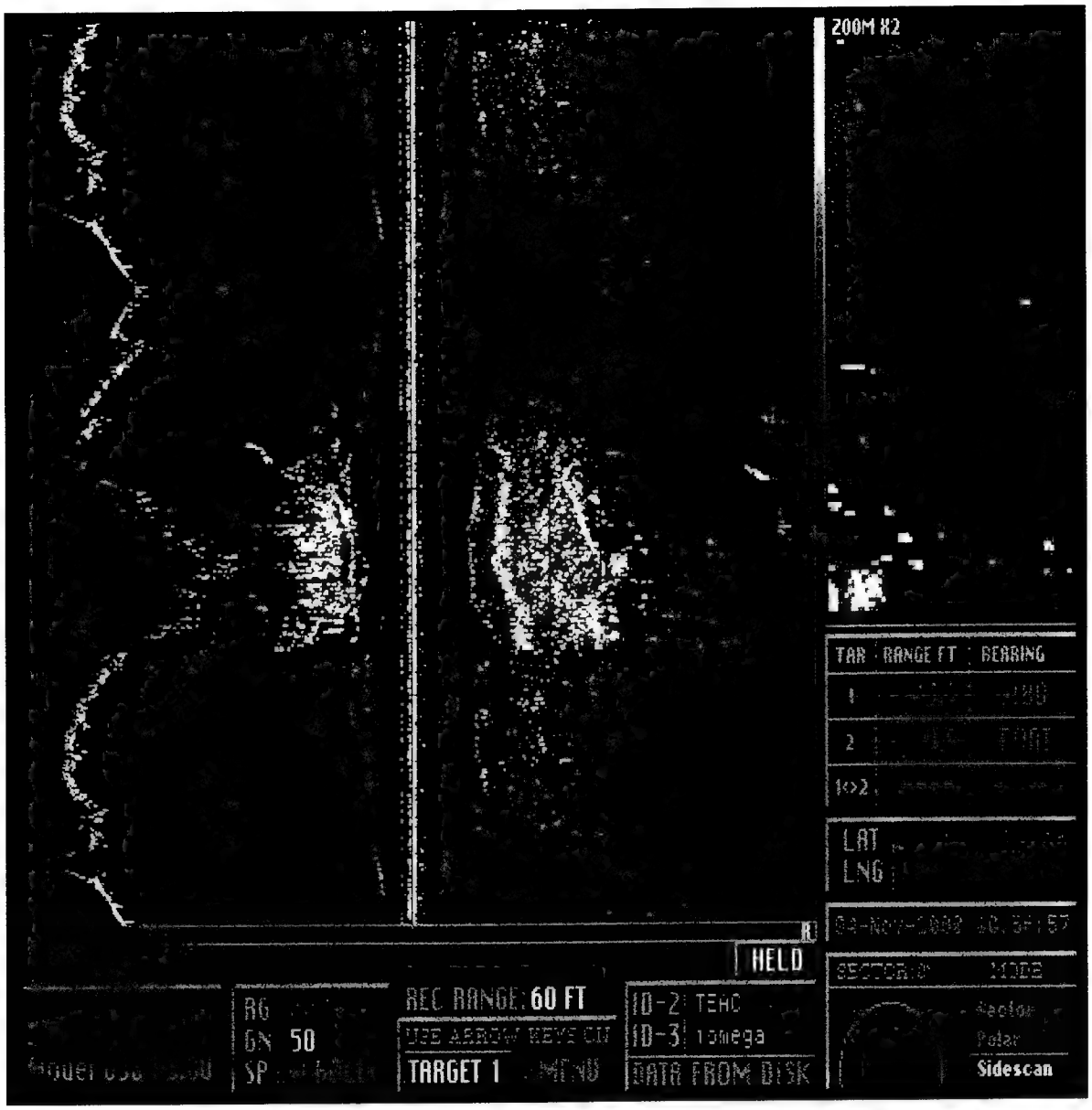

Figure 40. Acoustic image of Pinhook Bridge

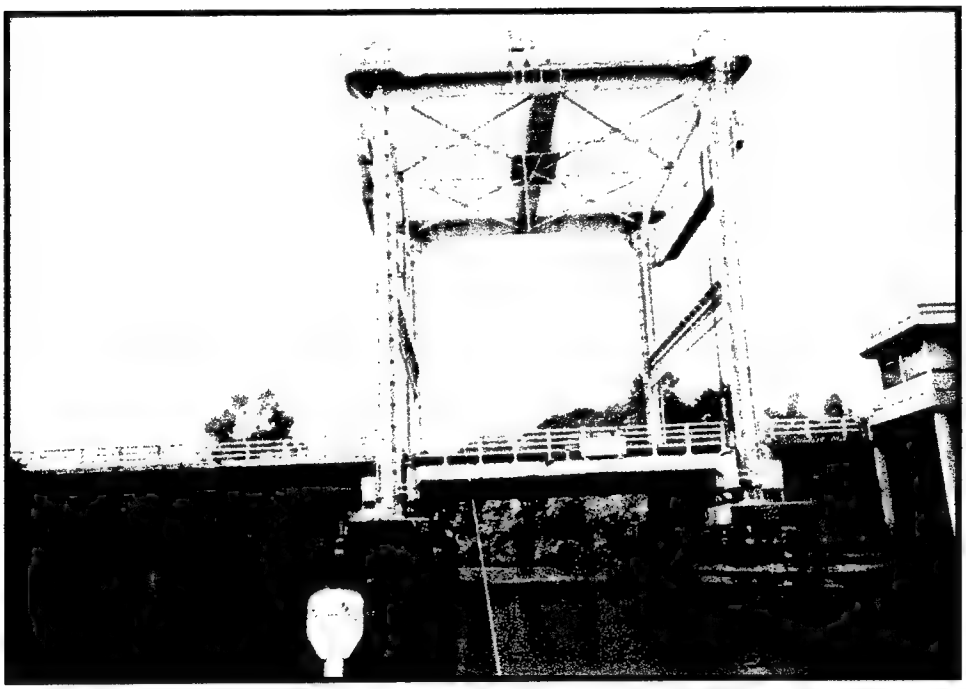

Figure 41. Photograph of Pinhook Bridge

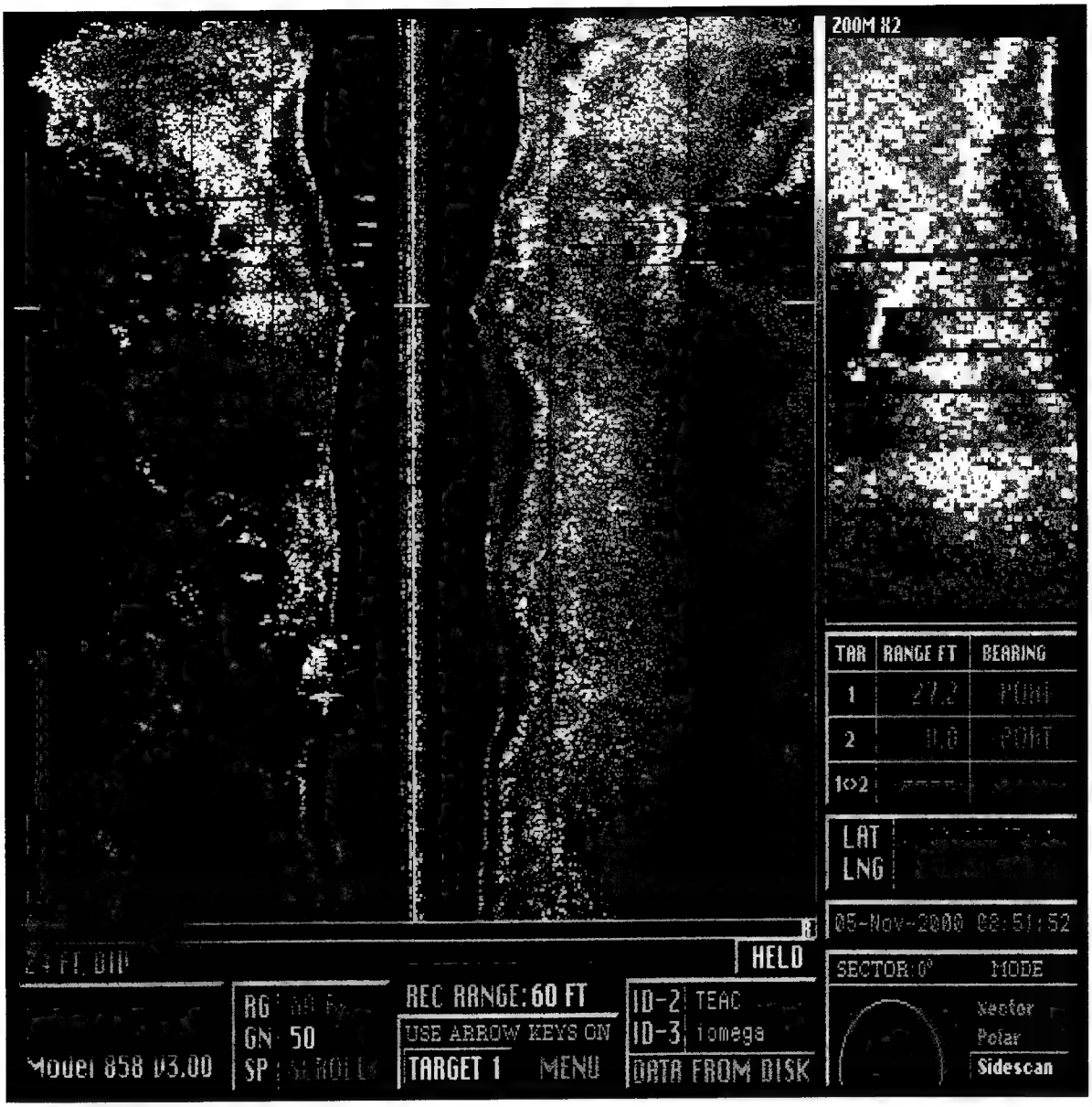

Figure 42. Acoustic image of Mouton Ave. Bridge

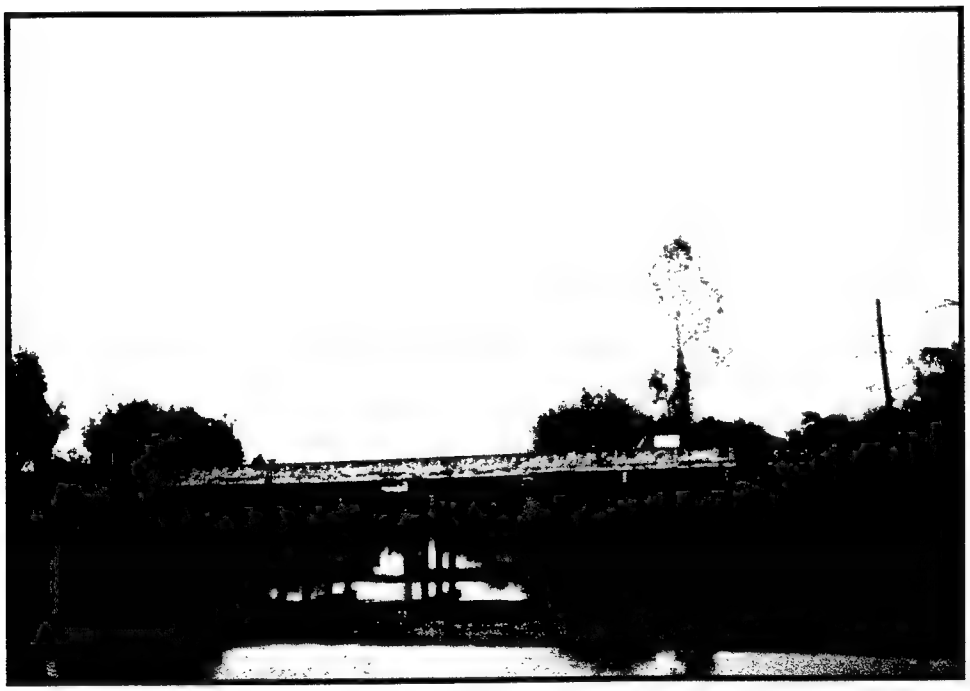

Figure 43. Photograph of Mouton Ave. Bridge

Figure 44. Photograph of Southern Pacific Railroad Trestle

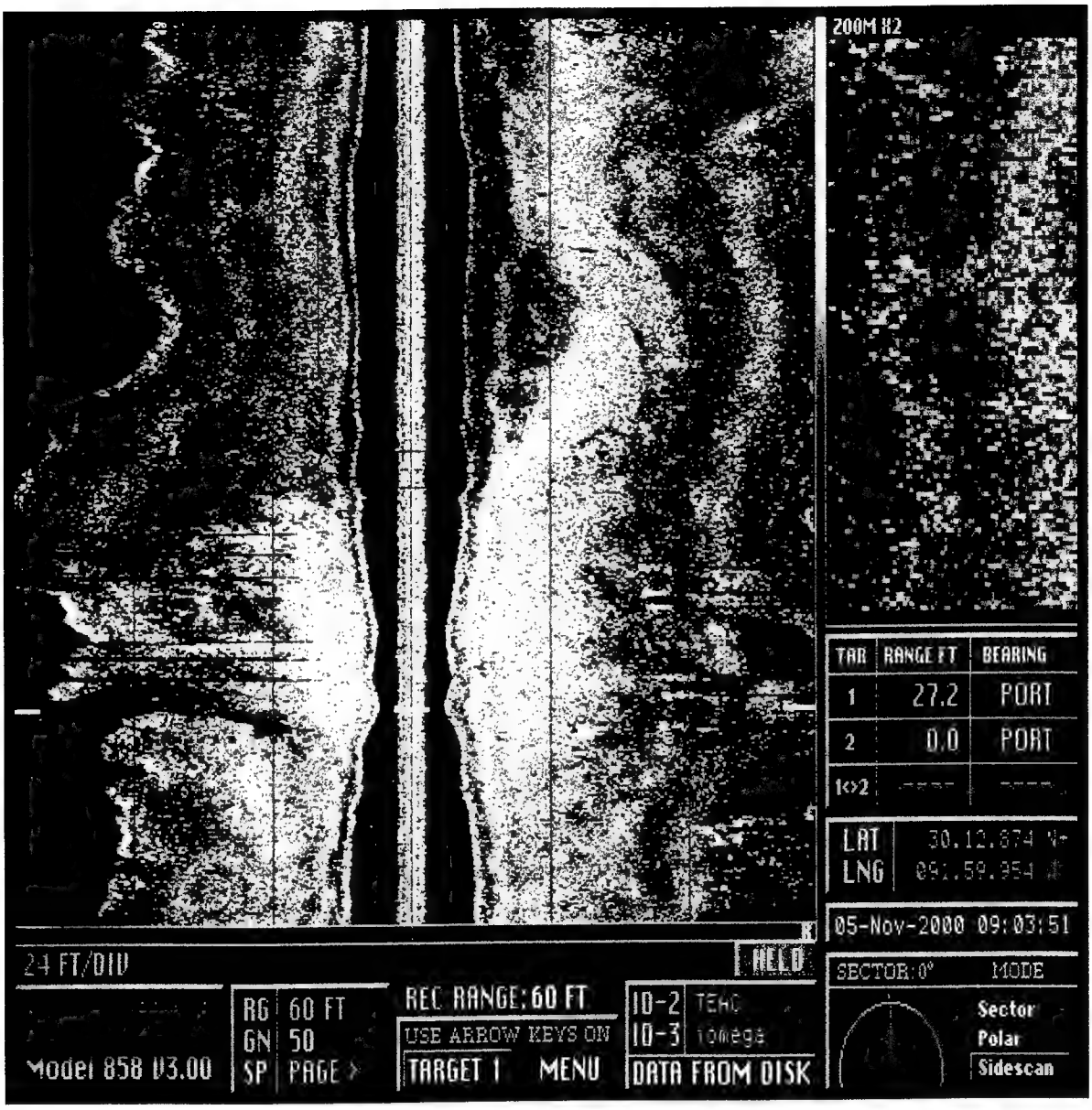

Figure 45. Acoustic image of E. University Bridge

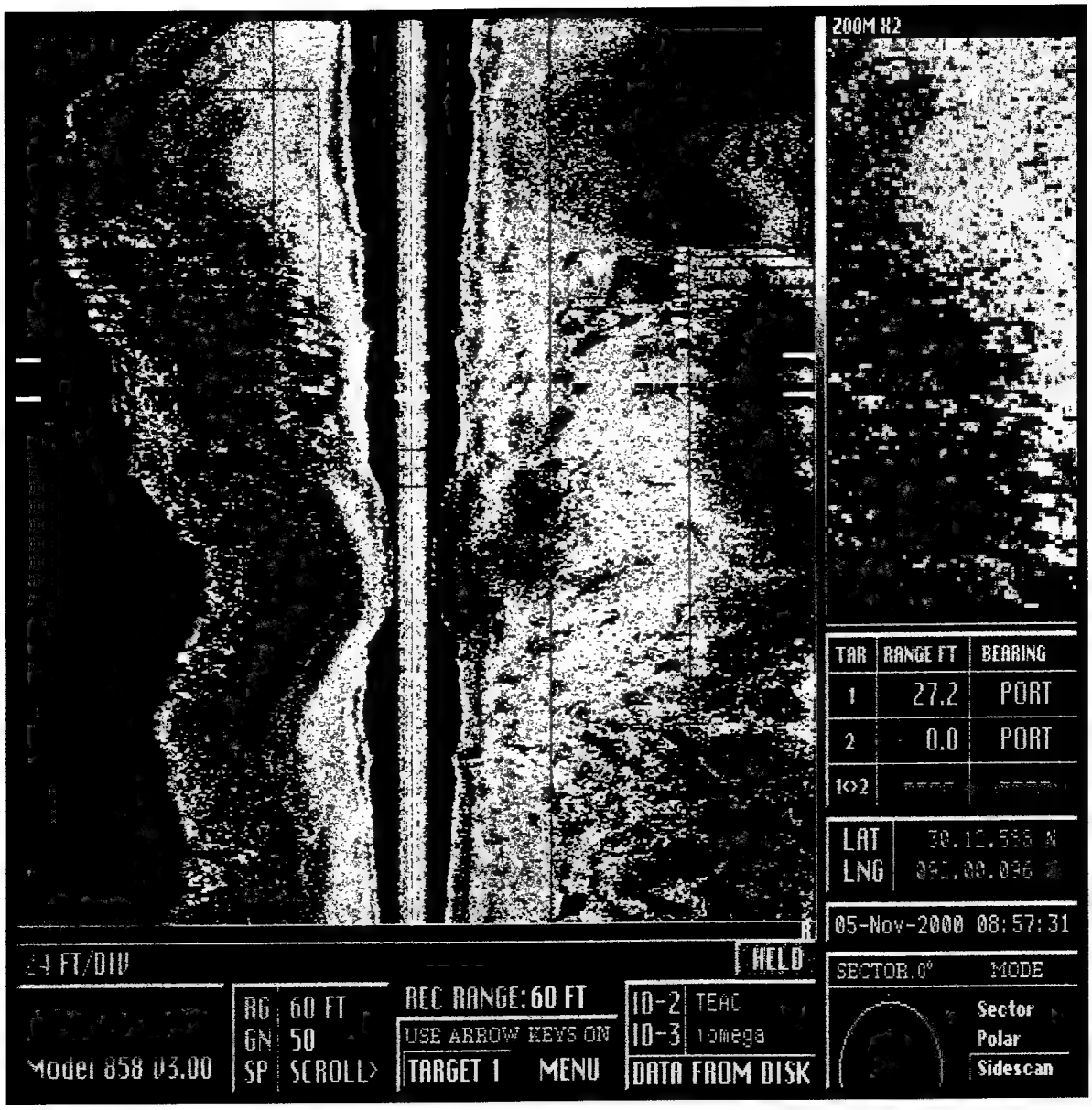

Figure 46. Acoustic image of Rt. 90 Bridge

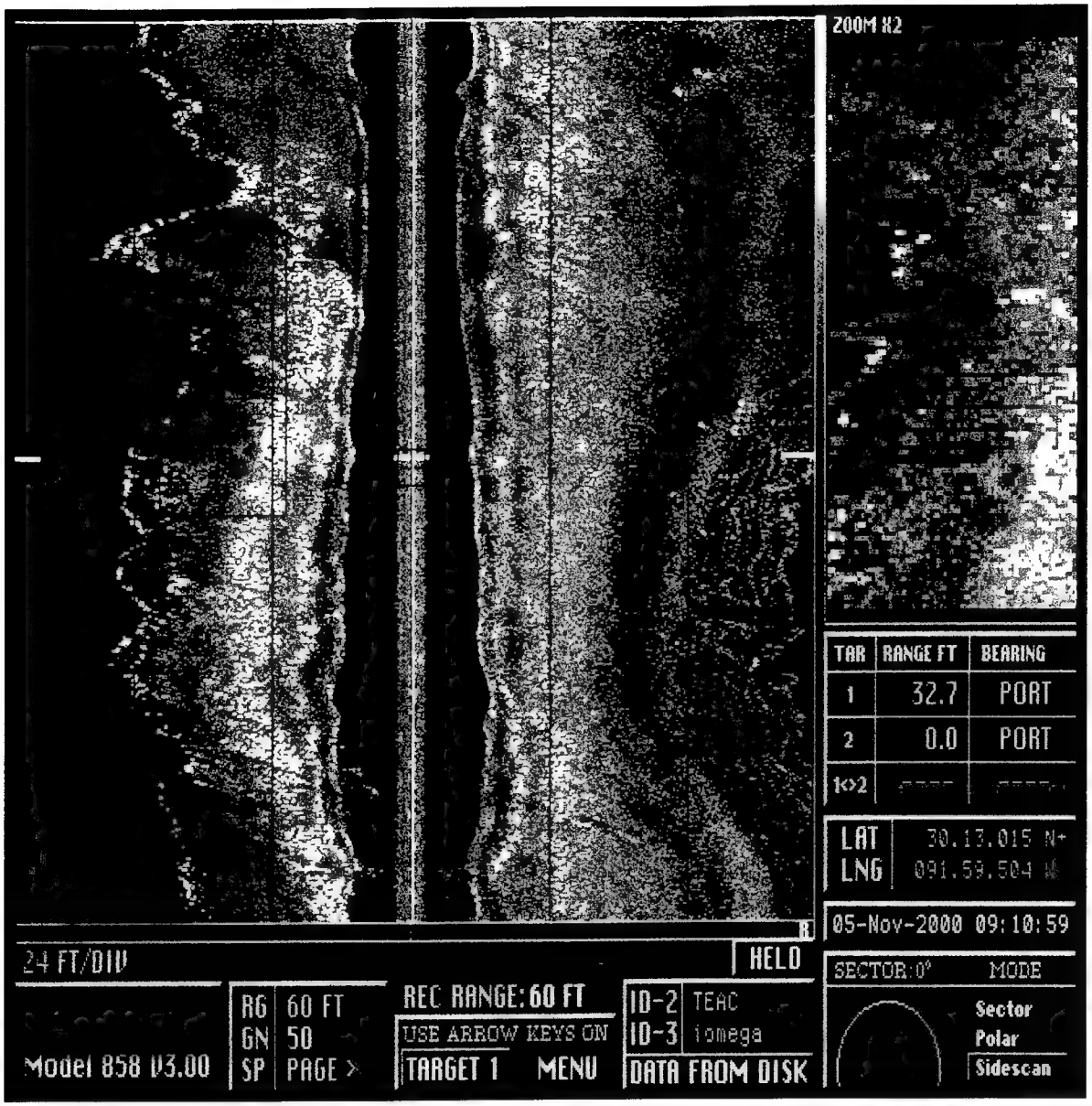

Figure 47. Acoustic image of Surrey St. Bridge

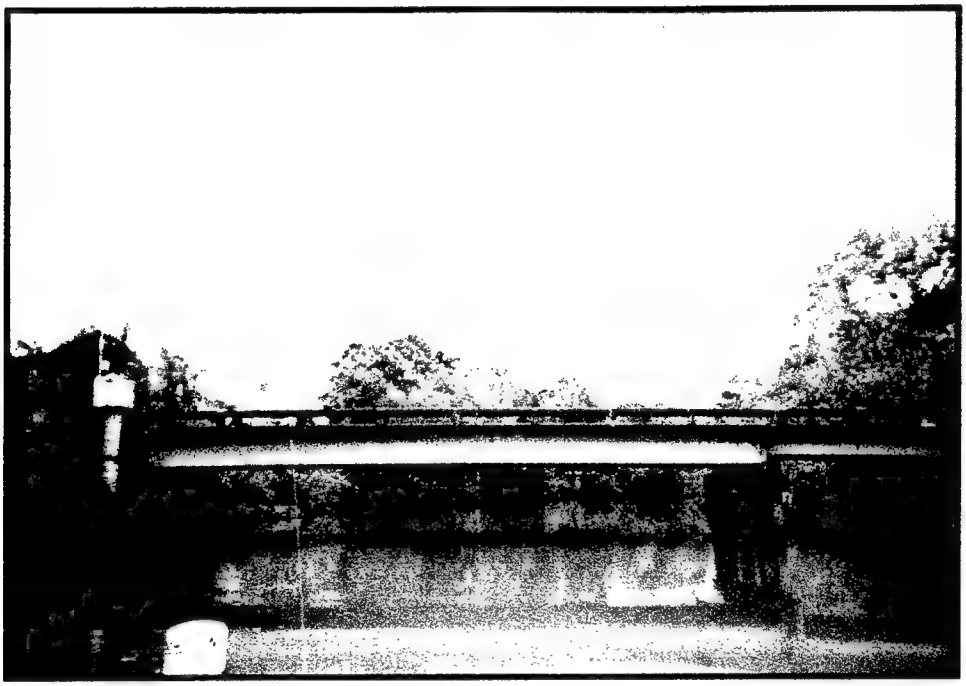

Figure 48. Photograph of Surrey St. Bridge

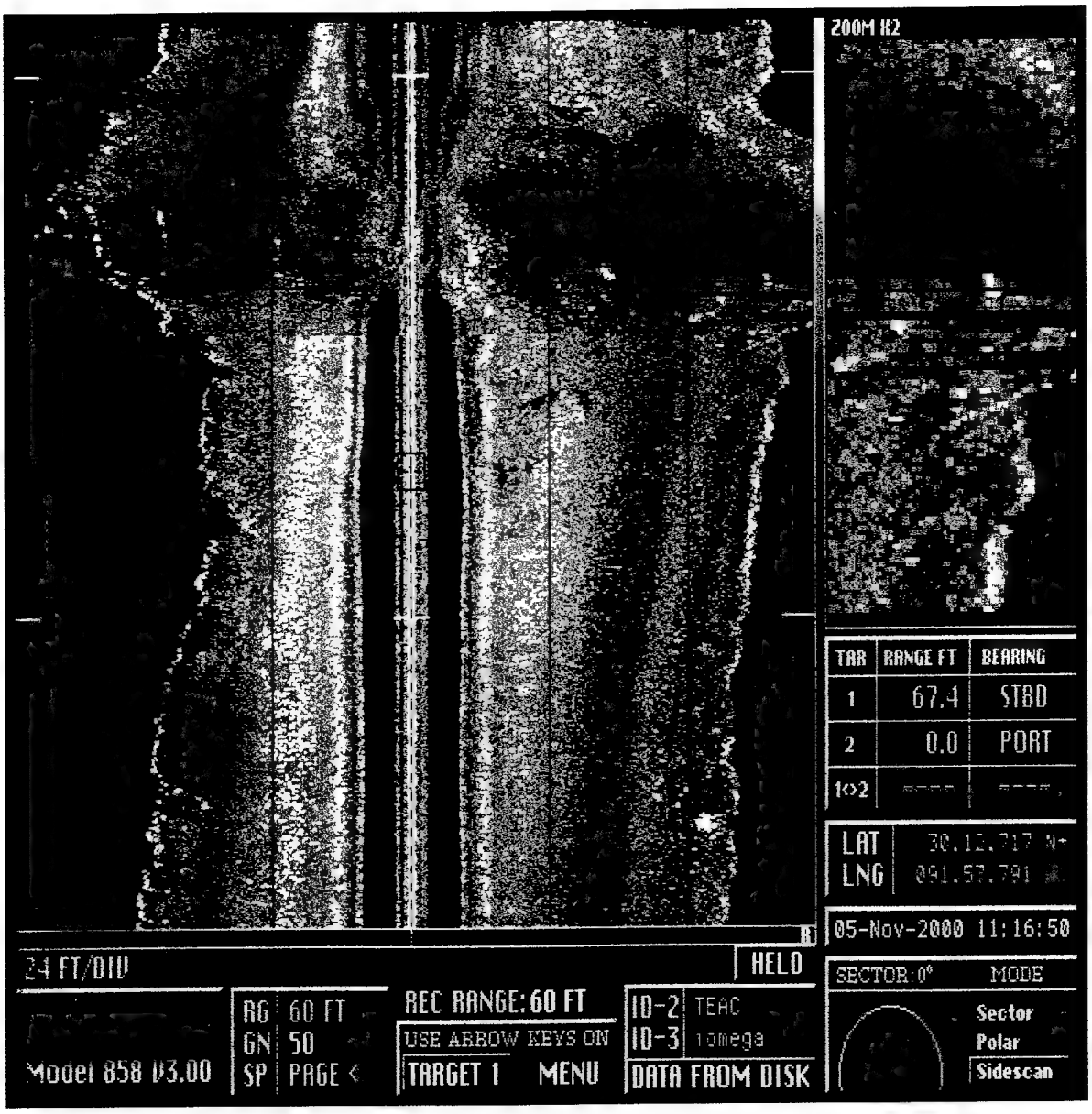

Figure 49. Acoustic image of Route 353 Bridge

Figure 50. Photograph of Route 353 Bridge

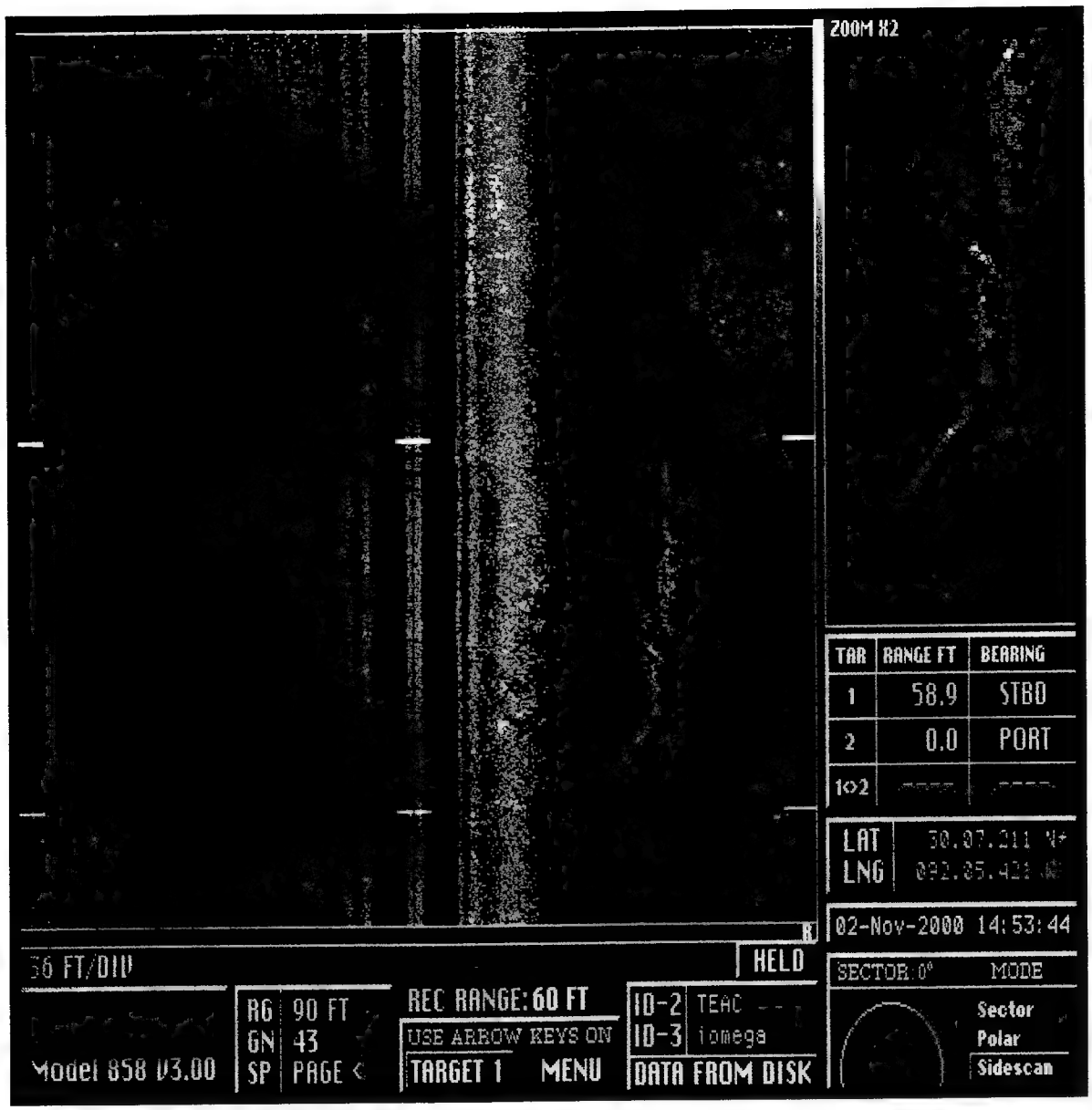

Figure 51. Acoustic of Conoco and Louisiana Gas Pipelines

Figure 52. Photograph of Conoco and Louisiana Gas Pipeline Signs

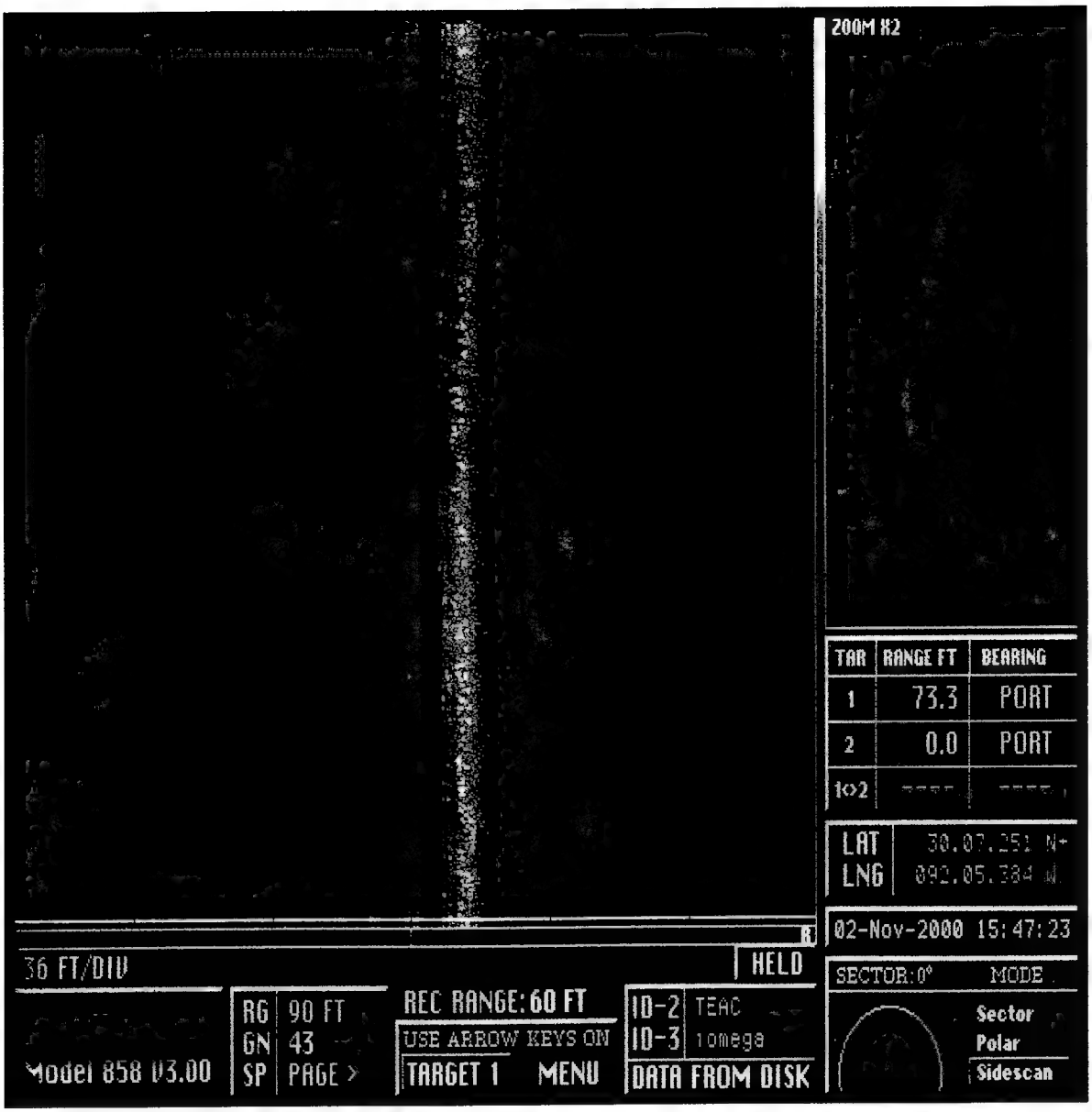

Figure 53. Acoustic image of Shell and Louisiana Gas Pipelines

Figure 54. Photograph of Shell and Louisiana Pipeline Signs

Figure 55. Photograph of Columbia Gulf Transmission Pipeline – Target 10

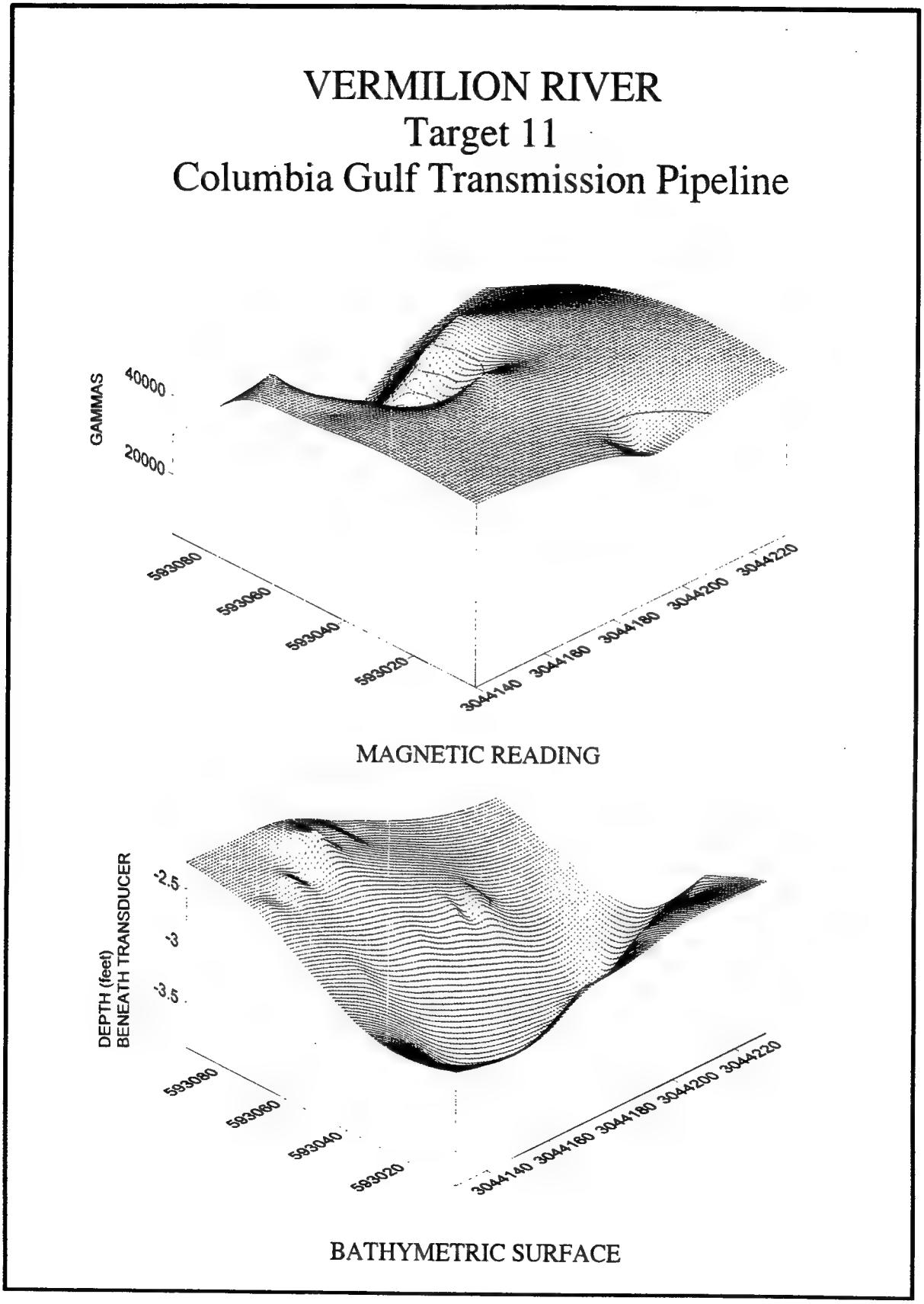

Figure 56. Surfer image of Columbia Gulf Transmission Pipeline – Target 11

(M57). Target 11 contains three high amplitude magnetic anomalies, M33, M46, and M58. Two Texas Gas Pipelines also are located in Block 2; they are Targets 16 (M52 and M68) (Figure 57) and 18 (M41 and A25). The Koch Gateway Pipeline, Target 31, lies within Block 4; three magnetic anomalies comprise this target (M127, M149, M157) (Figure 58). Near the airport in Block 8 is the FAA Cable Crossing area of Target 57, which consists of one magnetic anomaly (M279) (Figure 59). The United Gas Pipeline (Figure 60), also located in Block 8, consists of only one magnetic anomaly (M289). Another possible pipeline is the Norcen Pipeline; the location of this pipeline, as derived from archival sources, is at Easting 3042319.9, Northing 586234.3 (DTC, Inc. 1992c). However, no magnetic or acoustic anomalies were detected during survey in the reported location of this pipeline. Nevertheless, no further work is warranted for any of the pipeline targets.

Bulkheads

A number of bulkheads line the banks of the Vermilion River along the area surveyed. They are constructed of a variety of materials; some have been built professionally, while others are built of scrap materials in a makeshift way (Figures 61 and 62). The remote sensing equipment was able to detect most of the extant bulkheads in the area, as well as those that had deteriorated and fallen down into the water, and that now comprise debris along the river bottom and banks. Some of these bulkheads were assessed as targets because they also were associated with debris fields along the bottom. Targets 12 (M36, M49, M63), 21 (M86, M98, M113, A27), 23 (M87, M95, M117), 28 (M124, M152, M155), 29 (M125, M151, M156), and 54 (M248, M258) were bulkheads that had deteriorated and fallen into the river, generating debris scatters along the bottom, or bulkheads with associated pipes and other ferrous materials extending to the river bottom. Targets 13 (M38, M50, M64, A21) and 52 (M244, M245, M262) were major bulkheads associated with commercial operations along the river; Target 13, located in Block 2, was the Acadiana Shell and Sand Company bulkhead, along which were docked a number of large barges unloading materials (Figures 63 [acoustic] and 64). A large amount of debris along the bottom of the river also was associated with this bulkhead. Target 52 was associated with the old Trappey's Cannery located in Block 7 (Figure 65); this target also had a large quantity of associated debris. None of these targets were considered to be significant cultural resources. No further work is warranted for the bulkhead targets.

Debris

To understand the patterning and distribution of magnetic anomalies and debris within the Vermilion River, a sub-sample of 1,000 ft in each block was taken for a statistical analysis of the total counts of ferrous material recorded (Table 13). Each 1,000 ft sub-block was analyzed to identify all magnetic perturbations greater than one-half (.5) gammas. Because these samples did not filter out any data, they produced, as realistically as possible, counts of minor ferrous objects within the sample areas. From these data, a standard statistical analysis was performed to calculate the average amount of debris in each survey block, and in the whole study area. Because the analysis was based on samples, the results should be considered as a "snapshot" of the river's load of debris, with fluctuations expected as a result of channel depth, natural and man-made catchment areas (e.g., snags, bridge abutments and bulkheads), and from direct deposition of ferrous debris in specific areas of attempted bankline stabilization or at individual dumping sites used by property owners. Table 13 presents the results of the analysis.

Block 1 had 16 magnetic anomalies within the 1000-ft sub sample; approximately 168 magnetic anomalies were expected to be found within Block 1. The low frequency of ferrous targets recorded in Block 1 may be attributed to a relatively low degree of land development along the bankline, and to a relative absence of associated debris dumped

Table 13. Statistical Analysis Table of Debris Anomalies

N	Block	NAD 83 X_1	NAD 83 Y_1	NAD 83 X_2	NAD 83 Y_2	Anomalies per sample	Anomalies per block	Sampling Distance
1	9	3083342.5	623042	3083861.1	623903.1	16	84	1005.2
2	8	3073848.5	624450.1	3074851.6	624506	25	264	1004.7
3	7	3068305.5	618396.2	3068018.5	619352.4	27	285	998.3
4	6	3062821.1	615278.8	3063832.4	615311.3	30	317	1011.8
5	5	3058522.4	610610.9	3057551.7	610874.7	30	317	1005.9
6	4	3054254	610226.3	3054698.8	609326.4	27	285	1003.8
7	3	3049194.7	599199.8	3048184.1	599223.8	23	243	1010.9
8	2	3048060.9	599368.6	3047278.6	599961.2	22	232	981.4
9	1	3041776.9	587857.4	3041520.3	588775.5	16	169	953.3
						Total Average	**2196**	

Degree of Freedom	**8**
Total Samples	**9**
Average # Anoms	**24**
Median	**14.5**
Standard Deviation	**5.29**

onto the bankline. Block 2 showed an increase in the estimated amount of ferrous debris, as a result of more dense development of the adjacent lands for residential use. Block 3 was moderately developed for residential use, with development increasing as the center of Lafayette was reached. The total magnetic anomalies counted for this sub-block yielded 23 magnetic anomalies in the 1,000 foot sub block, and an estimated 285 magnetic anomalies expected for this block. This survey block appears to lie within a zone of change from low/moderate development to highly developed bankline residential areas, with an associated increase in debris.

Blocks 4, 5, and 6 had the greatest calculated density of ferrous debris, ranging from 285 to 317 expected magnetic anomalies per survey block. These three blocks lie within the areas of maximum residential development and bankline development. Block 7 had an estimated 287 magnetic anomalies within its boundary; this block is in a zone of change from highly developed banklines, with considerable heavy industry and magnetic debris, to an area of rapidly decreasing bankline development beyond the Lafayette Airport. Blocks 8 and 9 both reflect a decrease in debris, that may be associated with less dense bankline development. Block 8, located past the airport, had an estimated 264 anomalies; this block (once the regional airport is passed), quickly turns into a moderately wooded area with several outbuildings in various stages of decay, along with water pumping stations possibly associated with farming. Block 9 appears to be devoid of development, and it registered only 16 magnetic anomalies per 1000 feet. This number reflects the same relatively low levels of debris and development as were recorded for Block 1. An estimated total of 2,196 ferrous objects are expected to be buried in this 17.5 miles of survey along the

Figure 57. Photograph of Texas Gas Pipeline – Target 18

Figure 58. Photograph of Koch Gateway Pipeline

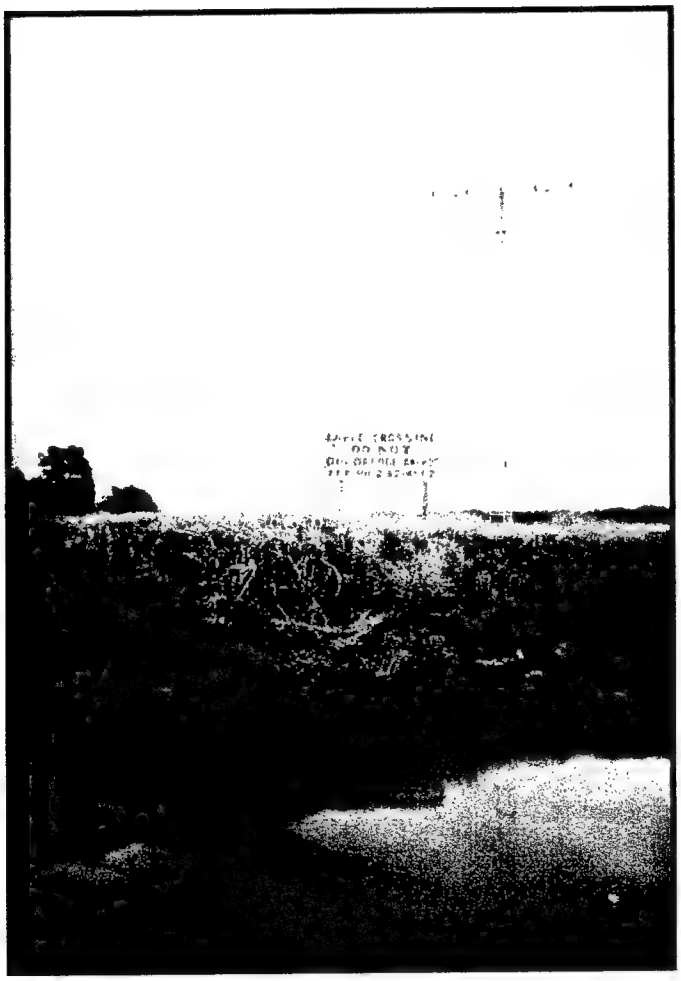

Figure 59. Photograph of FAA Cable Crossing

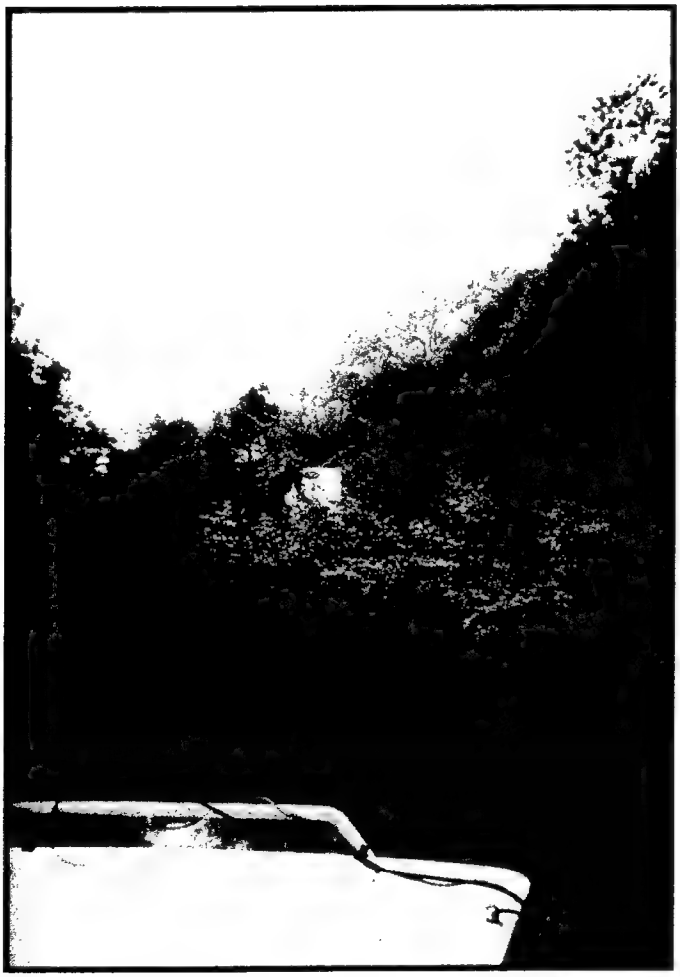

Figure 60. Photograph of United Gas Pipeline

Figure 61. Photograph of bulkhead – Target 6

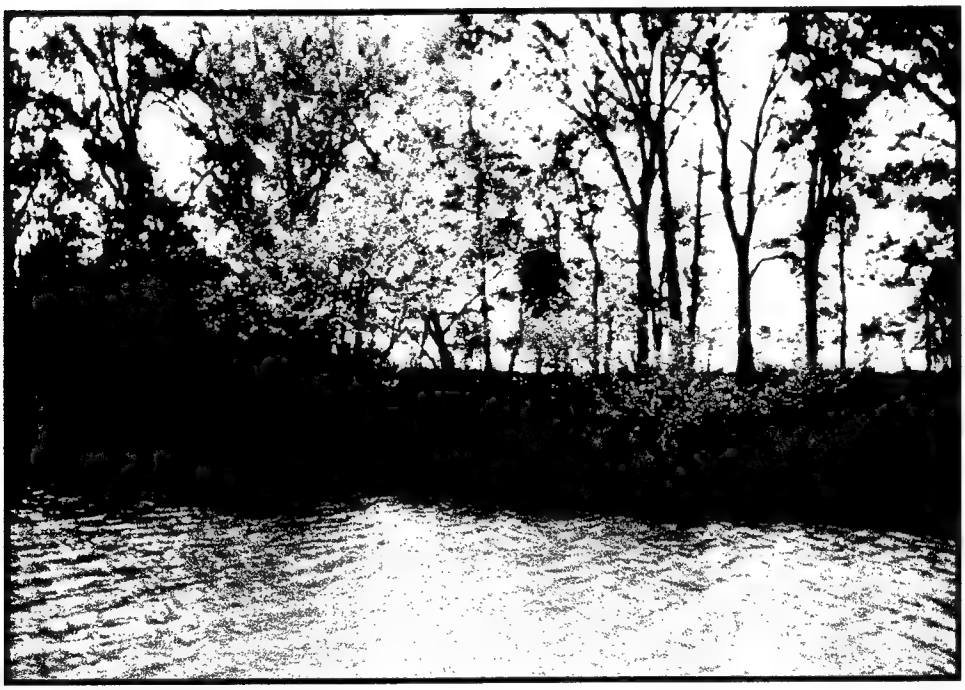

Figure 62. Photograph of bulkheads

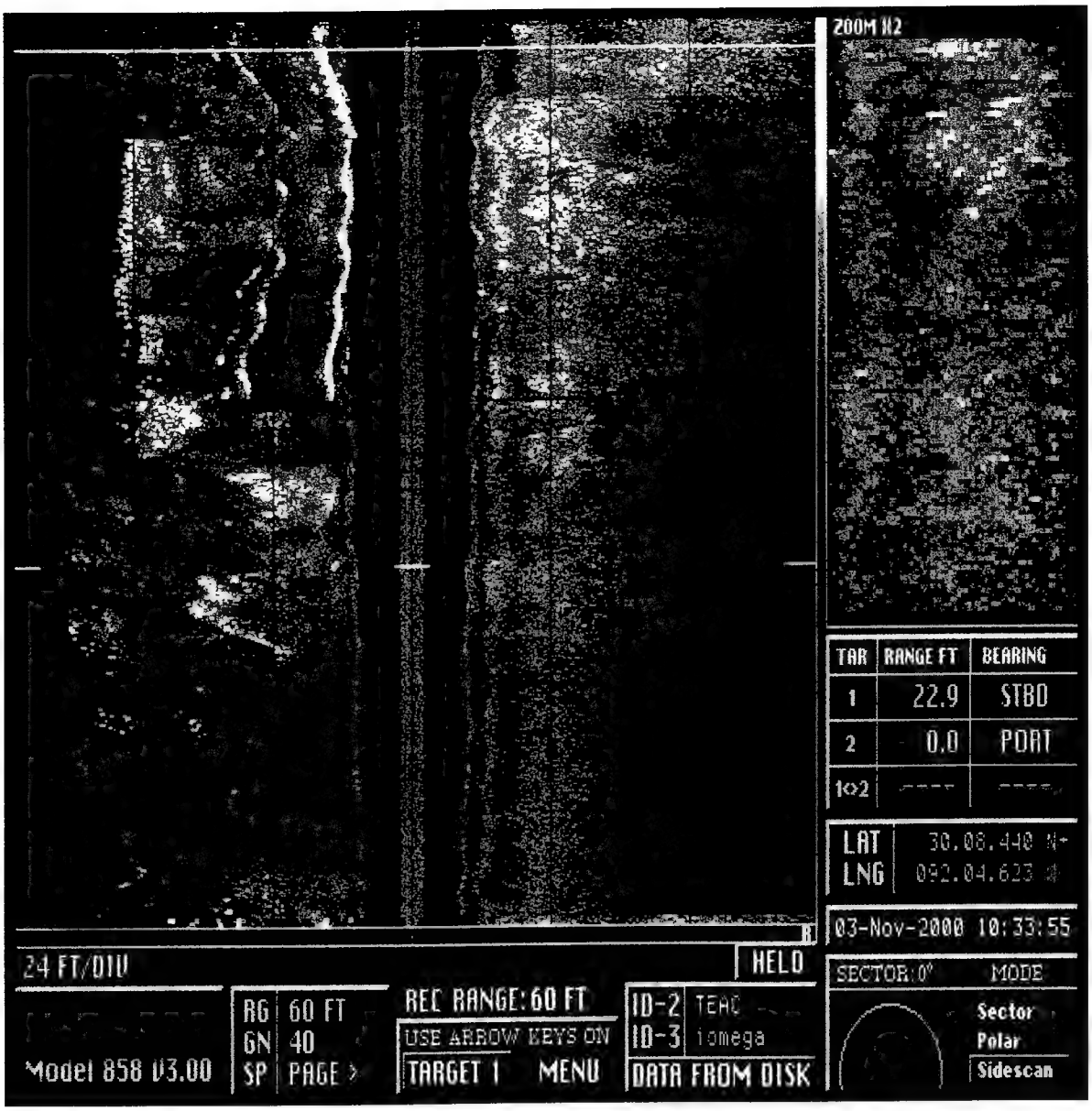

Figure 63. Acoustic image of Acadiana Shell and Sand waterfront

Figure 64. Photograph of Acadiana Shell and Sand waterfront

Figure 65. Photograph of Trappey's Cannery

Vermilion River from the Milton Bridge in Milton, Louisiana, to the Rt. 353 Bridge north of Lafayette, Louisiana. The dearth of acoustic anomalies associated with magnetic perturbations indicates that the majority of the anomalies either all are small point sources or they are buried beneath the sediment level. However, several areas of river bottom had enhanced reflectivity, indicating large amounts of man-made debris (Figure 64, Target 13, Acadian Shell and 7 Sand). This estimated total does not include wood, plastics, or nonferrous debris, all of which are known to be plentiful throughout the study area. All of the debris found during the riverine remote-sensing survey appears to be recent in origin.

No further work is recommended for any of the targets recorded within the study area, or for the minor debris anomalies, since they do not represent significant cultural resources.

CHAPTER VII

CONCLUSIONS AND RECOMMENDATIONS

The Vermilion River dredge maintenance project area extends from the Milton Bridge in Vermilion Parish, to the Rt 353 Bridge north of Lafayette in Lafayette Parish, Louisiana. A total of 17.5 linear miles of river floor were subjected to remote sensing survey to identify potentially significant cultural resources that could be impacted by the proposed dredging regime. Water depths in the project area ranged from approximately 3 - 15 ft.

Obstructions in the project area included bridge construction, pipelines, bankline debris piles, and innumerable submerged snags. A total of 25 modern features, including 11 bridges and railroad trestles, 14 pipelines and cables, and one submerged cable crossing were recorded. One pipeline recorded in the documentary investigation was not observed in the field, i.e., the Norcen Pipeline (DTC Inc 1992c). The locations and descriptions of these anomalies are noted in Appendix II. Individual piers, docks, and private floating boat launches were not recorded during this survey.

Figure 3a-i shows the spatial distribution of magnetic anomalies recorded during survey. A total of 296 individual magnetic anomalies were detected during the Vermilion River remote sensing survey. A total of 44 acoustic anomalies also were recorded, of which 23 had corresponding magnetic data. All of the acoustic anomalies comprised natural debris such as submerged trees and logs; modern, man-made debris that has washed into the river from the shore, fallen off vessels, or been discarded; or bridge abutments.

A total of 60 target clusters were identified from the magnetic and acoustic data for detailed study. Twenty-five of these clusters proved to be modern features documented along the survey route. Analysis of the remaining 38 targets indicates that they represent modern debris of various types that littered the river bottom. None of the targets identified within the Vermilion River study area represented submerged sites, ships, or objects of cultural significance. As a result of this survey, no further archeological investigations are warranted or recommended within the 17.5 mi Vermilion River project corridor. The planned project will have no effect on cultural resources eligible for or listed on the National Register of Historic Places.

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APPENDIX I

SCOPE OF WORK

REVISED SCOPE OF WORK

MARINE MAGNETOMETER AND SONAR SURVEY
FOR MAINTENANCE DREDGING,
VERMILION RIVER, LOUISIANA.

Contract No. **DACW29-97-D-0018**

I. LOCATION, OBJECTIVE, PURPOSE AND AUTHORITY

1.1 Location: The study area is located within and along the Vermilion River in Lafayette and Vermilion Parishes, in the vicinity of the cities of Lafayette and Milton. **The project begins on the Vermilion River at the State Route 353 bridge crossing east of Lafayette and ends at the Milton Bridge, for a total length of approximately 17.5 miles.** A portion of this length of river has previously been surveyed by R. Christopher Goodwin and Associates (CGA). **Attachment I** (study area plans) illustrates the location of the study area.

1.2 Objective: Conduct historical literature search and records review to determine the following: 1) the location of known cultural resource sites; 2) the location of high potential areas for cultural resources; and 3) past and present ground disturbance including bridge pilings, pipeline crossings, etc. All available geomorphologic literature should be evaluated and incorporated into the development of an applicable methodology. Upon completion of the literature search and records review, the contractor will conduct a remote sensing survey to identify underwater cultural resources and to locate and confirm locations of modern obstructions and debris in the waterway. Following completion of this remote sensing survey, a scientific\technical cultural resource report will be produced. The report will document the findings of the investigation, provide recommendations for future investigations, and will be utilized by Corps of Engineers (COE) personnel to assess project impacts and develop realistic cost estimates for future investigations if needed. This information will also be utilized by Engineers at COE to identify submerged pipelines, cables, and other debris that must be avoided during dredging operations.

1.3 Purpose: To obtain the professional services, labor, materials and equipment necessary to complete above noted objective.

1.4 Authority: The U.S. Army Corps of Engineers (COE) is obligated under the National Historic Preservation Act (NHPA), and National Environmental Policy Act (NEPA) to take into account the effect its undertakings have upon cultural resources within a given project area. Under these laws and regulations, the COE assumes responsibility for the identification and evaluation of all cultural resources within the project boundaries. In addition, the COE must afford the State Historic Preservation Officer (SHPO), and on occasion the Advisory Council on Historic Preservation (ACHP), the opportunity to review and comment upon proposed undertakings and associated

cultural resource investigations.

II. BACKGROUND

2.1 Proposed Federal Actions: The U.S. Army Corps of Engineers, New Orleans District will dredge approximately 16 miles of the Vermilion River near the community of Lafayette. Attachment I (study area plans) illustrates the location of the project area.

2.2 Previous Research: Cultural resource investigations have been conducted in the vicinity of the project area along the Vermilion River. In 1998, R. Christopher Goodwin and Associates (CGA) conducted marine and terrestrial surveys along the river in the vicinity of Lafayette and Milton. The marine portion of that survey overlaps with a portion of the current survey area. A variety of terrestrial surveys have also been conducted in the vicinity of the Vermilion River in Lafayette and Vermilion Parishes.

III. **SERVICES**: The contractor shall perform all work required providing the following services and products:

3.1 Cultural Resource Literature Search and Records Review (Task I): The Contractor will conduct a comprehensive literature search and records review prior to the start of the field investigations. This will include, but may not be limited to the following: 1) review of all available historic maps and aerial photos; 2) examination of local and regional historic archives and public records; 3) a review of the State of Louisiana's cultural resource site files; 4) a review of the National Register of Historic Places; 5) a review of geomorphologic data and reports; 6) a review of past cultural resource reports and records; and 7) interviews with local informants and collectors.

The literature search, records review, historic maps, and aerial photos will determine the location of known cultural resources and the potential for such resources within the project area. Determining the significance for each cultural resource will be based upon its relationship to specific research goals and problems. Following completion of the literature search and records review, the Contractor and COR will meet to evaluate and/or reevaluate the research and field methodology to determine the need for a modification to the scope of work.

3.2 Marine Cultural Resource Survey (Task II) : Upon completion of Task I, the contractor shall conduct an underwater cultural resource survey within the banks of the Vermilion River.

A. The equipment array required for the remote sensing investigation will include 1) a marine magnetometer; 2) a positioning system; and 3) a side-scan sonar system. Specific services are as follows:

(1) transect lane spacing will be no less than 50 feet apart.

(2) positioning control points will be obtained at least every 100 feet along transects.

(3) background noise will not exceed +/- 3 gammas.

(4) magnetic data will be recorded on a 100-gamma scale.

(5) the magnetometer sensor will be towed a minimum of 2.5 times the length of the boat or projected in front of the survey vessel to avoid noise from the survey vessel.

(6) the survey will utilize the Louisiana State Plane Coordinate System (NAD 1983).

(7) a metal probe will be used to identify the boundaries of any potentially significant sites in the project area.

3.3 Laboratory Analysis and Cultural Resource Report (Task III): All cultural material, reports, drawings, maps, photographs, notes, and other work developed in the performance of this contract shall be and remain the responsibility and/or sole property of the Government and may be used on any other work without additional Compensation to the Contractor. The Contractor agrees not to assert any rights and not to establish any claims with respect thereto. The Contractor agrees to furnish and provide access to all retained materials at the request of the COR.

A. It is recognized as unlikely that any cultural materials will be collected during the marine survey. However, the occasion may arise that they are collected from the bankline or other unexpected location. In that event, laboratory analysis and curation will be conducted in accordance with the following:

(1) All recovered archeological materials and artifacts shall be washed, reserved/stabilized and cataloged. All cultural materials shall be properly stored and secured from vandalism and extremes in temperature and humidity.

(2) Laboratory techniques and artifact analysis should meet acceptable professional standards. Any faunal and floral remains will be identified according to standard zooarcheological procedures.

(3) Following completion of this delivery order, all cultural materials and records will be turned over to the State of Louisiana, Division of Archeology, Office of Cultural Development. Thus, all cultural materials and records will be cataloged according to the Division of Archeology's standards. The contractor shall work with the Louisiana Division of Archeology and the COR to coordinate the transfer of all archeological materials and records

B. Following completion of the field work, a draft report shall be prepared. The draft cultural resource report is expected to be a polished product and accurate representation of the final report with two exceptions: 1) the draft report will be double spaced and 2) photographs may be photo-copied rather than being in publishable form.

Report style shall follow acceptable professional standards as established by American Antiquity. The Cultural Resource Report shall contain, but not be limited to the following:

(1) Discussion of proposed Federal action/project.

(2) Overview of regional prehistory, history and previous cultural resource investigations.

(3) Research methodology and detailed discussion of investigative techniques.

(4) Local geology and environment.

(5) Discussion of project impacts and recommendations for future investigations.

For the marine survey section of the report the following will be included:

(1) Post-plots of survey plan views and contours of all potentially significant anomalies.

(2) Comparisons of magnetic and sonar data, where applicable.

The interpretation of identified magnetic anomalies will rely on expectations of the character (i.e., signature) of shipwreck magnetics derived from the available literature. Interpretation of anomalies will also consider probable post-depositional impacts and the potential for natural and modern, i.e., insignificant, sources of anomalies. An inventory of all anomalies recorded during the underwater survey will be provided in the report. These anomalies will include not only those of possible cultural resource significance, but will also include anomalies associated with pipelines, cables, modern debris and garbage, construction or commercial materials, and related items. For any anomaly of possible cultural resource significance, the Contractor will file state site forms with the Louisiana State Archeologist and cite the resulting state-assigned site numbers in the final report. The Contractor will attempt to identify the nature and significance of these resources, to the degree that it allows the recommendation of further identification and evaluation procedures. The discussions must include justifications for the selection of specific targets for further evaluation. Thus, the Contractor will classify each anomaly as either potentially eligible for inclusion in the National Register, or not eligible. Sonar images of potentially significant anomalies should be referenced and included in the report.

C. Once the draft report has been reviewed and accepted by the COR, a preliminary final report shall be prepared. Following inspection and acceptance of the preliminary final report, the final report will be prepared and 40 copies forwarded to the COR. A compact disc or diskette version of the final report should also be prepared and forwarded to the COR. The final report shall follow the format set forth in MIL-STD-847A with the following exceptions: (1) separate, soft, durable, wrap-around covers will be used instead of self covers; (2) page size shall be 8-1/2 x 11 inches with 1 inch

margins; (3) the reference format and report style will be analogous to American Antiquity. Spelling shall be in accordance with the U.S. Government Printing Office Style Manual dated January 1973. The cover of the report shall conform to the New Orleans District Cultural Resource Report Series standards and specifications. The COR will prepare a letter to the reader that will appear behind the Report Documentation Page at the beginning of the report.

IV. CONTRACTING OFFICER AND CONTRACTING OFFICERS REPRESENTATIVE

4.1 The COR for this project will be Edwin Lyon, CEMVN-PM-RN, (504) 862-2038.

4.2 The Contracting Officer (CO), and COR may at all reasonable times inspect or otherwise evaluate the work being performed. All inspections and evaluations will be performed in such a manner as will not unduly delay progress of the work. It is necessary that close coordination between the contractor and Government be maintained throughout all contract periods to ensure satisfactory completion.

V. CONTRACT SCHEDULE

5.1 Contract proposal and estimate shall be submitted within 14 days of receipt of delivery order package.

5.2 The Government shall review the proposal within 10 days of receipt.

5.3 The contractor shall begin Task I no later than 15 days following award of delivery order.

5.4 The Contractor shall complete Tasks II and III (completion of the draft technical reports) 100 days following award of the contract. Two copies of the draft reports will be submitted to the COR for review. The COR will review the draft reports and forward comments to the contractor 10 days following their receipt. The Contractor will make the required changes and forward the pre-final reports (1 copy each) to the COR within 10 days of receipt of the review comments. The COR will inspect the pre-final report and notify the contractor of its acceptance no later than 5 days following its receipt. The contractor will prepare the final reports and forward the final copies within 5 days of their acceptance. A reproducible master (both hard-copy and computer diskette or cd) and associated GIS/CAD computer data should accompany the final reports.

5.5 A brief, one page monthly progress report will be submitted along with each monthly billing voucher. The progress report will cover the billing period noted on the voucher. Each report will discuss project status, work performed, logistical problems and difficulties, if any, in meeting the contract schedule. Cost breakdowns should be grouped according to specific "Tasks".

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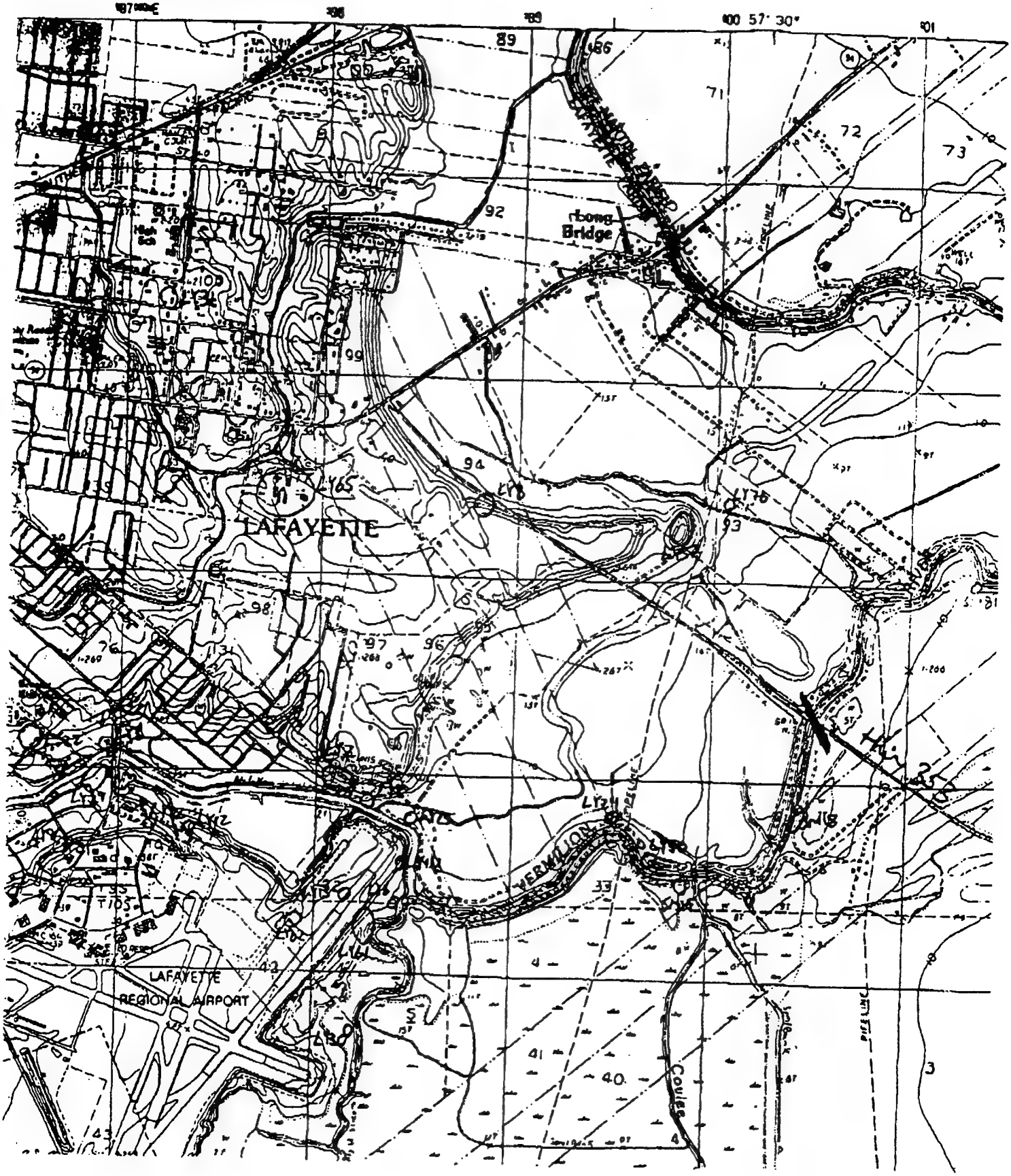
Broussard, LA 7.5
Provisional Edition 1983

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



APPENDIX II

INFORMATION ON BUILT RESOURCES IDENTIFIED DURING THE REMOTE SENSING SURVEY

Built Resources on Vermilion River from Milton Bridge to 353 Bridge Crossing

Anomaly No.	NAD 83 (ft) X	NAD 83 (ft) Y	River Mile	Description
Block 1				
M1	3044819.5	584030.0		debris and Milton Bridge
M6	3041905.3	587074		gas pipeline
M8	3044834.7	584030.1		bridge and debris
M15	3041925.9	587167.4		Louisiana Gas System Pipeline
M16	3041815.9	587464.5		pipeline
M18	3041536.2	590048.5		pipeline
M23	3044844.0	584038.8		bridge and debris
M27	3041864.1	587471.5		Shell & Louisiana Gas System Pipeline
M29	3041592.8	590079.8		gas pipeline
A5	3041393.47	589928.25		pipeline crossing
A11	3044867.19	583998.95		Milton Bridge
A15	3041856.17	587477.69		Louisiana Gas Pipeline
A16	3041637.63	590268.11		pipeline crossing
Block 2				
M33	3044172.0	593087.9		Columbia Gulf Transmission Pipeline
M35	3045640.5	595971.7		bulkhead and pipeline
M36	3045516.6	596388.5		bulkhead and pipeline
M39	3046068.4	597879.1		Eloi Broussard Bridge
M41	3046716.0	599812.1		Texas Gas Corp. Pipeline
M51	3046106.5	597720.3		Eloi Broussard Bridge
M52	3046320.0	598822.1		Texas Gas Corp. Pipeline
M53	3046591.0	599450.9		bulkhead and barge on surface
M57	3044033.9	592959.7		pipeline
M65	3046154.5	597678.7		Eloi Broussard Bridge
M66	3046240.7	598144.4		submerged cable
M68	3046326.4	598800.8		submerged cable
M69	3046559.8	599529.4		Texas Gas Corp. Pipeline
A21	3045731.86	597373.65		Acadiana Shell and Sand debris
A22	3046086.32	597833.04		Eloi Broussard Bridge
A23	3046497.54	599509.35		Texas Gas Pipeline
A24	3044063.29	592991.11		Columbia Gas Pipeline
Block 3				No Built Resources
Block 4				
M149	3052969.2	607920.6		Koch Gateway Pipeline

Anomaly No.	NAD 83 (ft) X	Y	River Mile	Description
M153	3052565.5	605381.5		Ambassador Caffery Bridge
M154	3052589.4	605382.4		Ambassador Caffery Bridge
A43	3052539.67	605400.62		Ambassador Caffery Bridge
Block 5				No Built Resources
Block 6				
M214	3065034.6	617205.2		Pinhook Bridge
M224	3065068.2	617178.0		bridge
M226	3064328.9	616306.6		Partially submerged modern wreck
A32	3064313.02	616239.93		Modern shrimpboat wreck
A33	3065113.09	617208.96		Pinhook Bridge
Block 7				
M238	3068795.6	621564.4		bridge
M240	3069728.4	622255.3		bridge
M251	09:10:33.9	625071.2		bridge and bulkhead
M255	3072603.5	625038.5		bridge and pipes
M261	3070199.7	623904.2		90 East Bridge
M264	3069812.8	622211.1		bridge
M267	3069013.3	621722.5		Train trestle
M268	3068764.6	621530.5		small modern wrecked boat
A34	3068160.30	620503.61		Modern small boat wreck
A35	3068315.16	620532.71		Modern small boat wreck
A36	3068772.70	621532.25		No named bridge
A37	3069026.71	621755.02		railroad trestle
A38	3069787.73	622149.70		Rt 90 Bridge
A39	3070123.52	623870.11		Two bridges
A40	3072620.37	625055.81		Small iron bridge
Block 8				
M279	3077540.0	623907.3		FAA Cable Crossing
M289	3081126.3	623849.3		United Gas Pipeline
Block 9				
M290	3084249.1	625569.6		Bridge 14
M291	3084088.2	624774.8		large intake pipes
M295	3082353.1	623167.7		working waterpump on surface
A42	3084278.74	625717.98		353 Bridge

APPENDIX III

RESUMES OF KEY PROJECT PERSONNEL

R. CHRISTOPHER GOODWIN, PH.D.
PRESIDENT & CEO

Dr. R. Christopher Goodwin, is President and Director of Research of R. Christopher Goodwin & Associates, Inc., a preservation planning, environmental management, and forensic sciences firm with offices in Frederick, Maryland, New Orleans, Louisiana, Tallahassee, Florida, and Birmingham, Alabama. A native of Maryland, he is a former Yale Peabody Museum Research Associate (1976), Arizona State University Fellow, and Smithsonian Institution (1979-1980) Research Fellow and Scholar-in-Residence. Dr. Goodwin holds degrees in Anthropology/Archeology from Tulane (B.A.), Florida State (M.S.), and Arizona State (Ph.D.) Universities; the latter institution named him a "College of Liberal Arts Leader," in 1997. He is an adjunct Professor in the Department of Anthropology at Florida State University.

Dr. Goodwin is recognized as one of the nation's leading experts in cultural resource management. He has been a contractor to the U.S. Army Corps of Engineers (Baltimore, Memphis, Nashville, New Orleans, Pittsburgh, Savannah, St. Louis, and Vicksburg Districts), to the Naval Facilities Engineering Command, and to the Department of Defense on numerous projects. During the past 19 years, he has served as Principal Investigator for major cultural resource investigations conducted by his firm in the Mid-Atlantic, Southeastern, Western, and Caribbean Regions. These projects have included such large-scale efforts as the architectural and archeological investigations at Baltimore's Oriole Park at Camden Yards stadium site; the new Baltimore Ravens Stadium; and the Washington Redskins' Jack Kent Cooke Stadium.

Dr. Goodwin's expertise also has been called upon for historic preservation planning projects, and for industrial and governmental agency compliance with federal and state laws and regulations governing archeological and historic sites. He has served as Principal Investigator on preservation and compliance projects for the National Capital, Southeast, and Southwest regions of the National Park Service (NPS); the Department of Energy (DOE); Her Majesty's Service, U.K.; the Louisiana Division of Archaeology; major utility companies, including Allegheny Power, ENRON, Texaco, Southern Natural Gas (SONAT), ANR/Coastal, Baltimore Gas and Electric Company, and Peabody Coal; the U.S. Fish and Wildlife Service, Northeast Region; the City of Annapolis; and, the Maryland Historical Trust. The geographic range of research and compliance projects completed under Goodwin's direction encompasses the Leeward Islands, Puerto Rico, the Bay Islands of Honduras, Maryland, Virginia, West Virginia, Pennsylvania, Ohio, Illinois, Arkansas, Florida, Georgia, Louisiana, Mississippi, California, and Texas.

Dr. Goodwin has published widely in the fields of prehistoric and historic archeology, and ethnohistory. His areas of particular expertise include preservation planning, cultural resource management, cultural ecology, prehistoric demography, field methods in archeology, human osteology, and historic archeology. He is a court-qualified expert in both historic archeology and in cultural resource management. In 1992, he was a recipient of the National Trust for Historic Preservation's National Preservation Honor Award for his work at Maryland's oldest surviving historic building, the Third Haven Meeting House, and of the Anne Arundel County Trust for Historic Preservation's Achievement in Archeology Award in 1992 and 1993. In 1997, he received the United States Small Business Administration's Administrators Award of Excellence, for "Outstanding Contribution and Service to the Nation," and the Maryland Historical Trust's Educational Excellence Award.

In addition to numerous technical reports and monographs, Dr. Goodwin has contributed to numerous scholarly journals, including *American Anthropologist, American Antiquity*, the *Florida Anthropologist*, and *American Scientist*. Dr. Goodwin is listed in *Who's Who in Leading American Executives* and *Who's Who Among Outstanding Americans*.

JEAN B. PELLETIER, M.A.
NAUTICAL ARCHEOLOGIST/REMOTE SENSING SPECIALIST

Jean B. Pelletier, M.A., graduated from the University of Maine in 1991 with a Bachelors degree in Geological Sciences, and received a Master of Arts degree in History from the University of Maine in 1998. His research interests include maritime history and nautical archaeology, steamboat technology, industrial technology, remote sensing, geophysics, scientific diving technology, and underwater photography/videography. Mr. Pelletier has formal training in marine geophysics, marine and terrestrial remote sensing, remotely operated vehicles, underwater video and diving safety, and has conducted archaeological, archival, and geophysical investigations in Alabama, Connecticut, Delaware, District of Colombia, Florida, Georgia, Illinois, Louisiana, Maine, Maryland, Massachusetts, Mississippi, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, South Carolina, and Virginia. As a graduate student at the University of Maine, Mr. Pelletier worked with Dr. Warren C. Riess as a research assistant on the Penobscot Expedition Phase II, conducting remote sensing and underwater documentation of the ships of the Penobscot Expedition.

Before joining Goodwin & Associates Inc., in 1997, Mr. Pelletier served as an archeological and scientific diving consultant for several universities and public utility companies along the Atlantic seashore. In this capacity, Mr. Pelletier managed the recovery of nine cannons from the *Nottingham Galley*, an eighteenth century English merchant ship lost on the ledges of Boon Island, Maine.

Since joining Goodwin & Associates, Inc., Mr. Pelletier has been involved in numerous Phase I, II, and III archaeological investigations of underwater sites. He has conducted remote sensing surveys in the Puerto Rico, Gulf of Mexico, Chesapeake Bay, and a Phase III recordation of the steamboat *Kentucky*, a confederate troop-transport lost on the Red River in 1865, near Shreveport, Louisiana. Mr. Pelletier's professional affiliations include: American Academy of Underwater Sciences, Marine Archaeology and Historical Research Institute (MAHRI), and the Society for Historical Archaeology.